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FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.



"EVERY man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruit, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kind of private principedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned." * * * * *

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON. * * * * *

"OUR English word To BUILD is the Anglo-Saxon Bylsan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"ALWAYS be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE. * * * * *

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The Builder.

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The Representation of Architecture at the Royal Academy.



WE have often expressed dissatisfaction with the manner in which architecture is represented at the Royal Academy annual exhibitions, mainly on three grounds:

the insufficiency of space, the prevalence of mere pictures of buildings in place of drawings from which the construction of the design could be studied, and the preference, obviously given to showiness of drawing, especially to drawings which are the work of those who may be called "professional draughtsmen," and which are not the work of the architect whose name they bear in the catalogue. As we have frequently heard similar dissatisfaction expressed by various members of the architectural profession, on these and other grounds, we have made an attempt to elicit the views of architects on this subject in a more general manner by sending to a good many architects a circular letter inquiring whether they were satisfied with the manner in which architecture was at present represented at the Academy exhibitions; if not, in what direction they would suggest that improvements might be made, and more especially if they were in favour of greater prominence being given to geometrical drawings in preference to mere pictures of buildings. We also requested each of our correspondents to state whether we were at liberty to quote his opinion by name.

We have received, up to the time of writing this, about fifty replies, some of them of considerable interest, and in all but one or two cases with full permission to cite them. Summarising their contents generally, we may say that the writers are almost unanimous in being dissatisfied with the architectural exhibition at the Academy as it at present exists. Among these, however, eight may be scheduled as "pessimistic," having no belief in the use of an exhibition of architectural drawings at all, and three others are pessimistic as regards the public who visit the Academy, considering that no kind of exhibition of architectural drawings will ever be intelligible or interesting to the public.

The other points touched upon in the

various letters may be broadly classified under the following heads: the object of an architectural exhibition; the kind of drawings to be exhibited; the space required, or the manner of distribution of the drawings; the employment of draughtsmen other than the author of the design; and what in France would be called the question of "the jury," of the persons by whom the selection of drawings is made. In this classification, by far the greater unanimity is found in regard to the preference of geometrical drawings over perspectives, twenty-nine correspondents decidedly advocating more prominent consideration being given to geometrical drawings, though we cannot help observing that several out of these habitually exhibit perspective drawings of their buildings executed by another hand than their own. This may no doubt be partly owing to an idea that effective perspective drawings are, under the present regime, more likely to be hung than geometrical drawings. Three correspondents only regard the space now given as sufficient (for reasons to be noted hereafter); six object to geometrical drawings, for various reasons; four think they should always be accompanied by perspectives, and twelve think that photographs of buildings are a useful addition and in some cases better than perspectives. Twelve correspondents object more or less strongly to the admission of perspective drawings made by a hired draughtsman who is not the designer. Seventeen consider that with the present space available no adequate representation of architecture is possible; and five consider that the selection of what shall be hung in the Architectural Room is often not in the right hands, and is made without sufficient knowledge of the points which give value to an architectural drawing.

We will proceed to quote the opinions of some of our correspondents on the various points classified above; it is impossible to quote them all, especially as some are expressions of nearly the same opinion in varying language.

The question, what is the real object of the exhibition of architectural drawings at the Royal Academy is of course, in a sense, at the bottom of the whole subject. The majority of our correspondents adopt, either tacitly or in so many words, the view that the exhibition is primarily for the benefit of those who wish to study architectural designs seriously, in their development in accordance with plan and construction; in other words,

that the exhibition should be primarily such as would interest architects, and that the public, if they are to pay attention to the exhibition, must learn to understand and study the drawings from the same point of view. Two or three of them, however, take very strongly the opposite view—that the exhibition is of no value unless it interests the public, and that the public will not find any interest except in drawings of a pictorial class. It is upon this consideration that the question of whether geometrical drawings or pictorial drawings are to be preferred to a great extent turns.

Two architect members of the Royal Academy itself have kindly given us their opinion on the subject. Mr. T. G. Jackson considers that there is little educational good to be got out of any exhibition of architectural drawings, but at the same time thinks that it is necessary that both architects and their employers should be able to see from year to year, in a collected form, what work is being done, and that "the exhibitions should illustrate the year's work correctly." This latter remark opens up an important consideration, on which other correspondents also touch, as to not merely the kind of drawings, but the class of work, which the contents of the Architectural Room should display. Mr. Jackson continues:—

"It would be very useful, and also very instructive, if photographs of buildings, or details of buildings actually carried out, were allowed to be shown, and models of an inexpensive kind, like Mr. Prior's this year, might be exhibited with advantage.

To encourage the exhibition of elevations would, I think, be mischievous. It should be the object of an architect to have as little to do with elevations himself as possible, and they ought never to be seen at all by anyone who is not an architect, because they are sure to mislead if presented as designs.

An elevation, so far as it is practically useful, need seldom be anything but a simple diagram finished in the roughest way, or, better still, never finished at all. To cook it up into a picture only misleads the designer to think in elevation instead of in perspective, and misleads the outside public to imagine that an elevation conveys a correct idea of how the building will appear when executed. The best way of illustrating buildings, in my opinion, is by perspective sketches, accompanied by plans and sketches of detail, and, as I have said above, by photographs."

Mr. Jackson's opinions as to the futility of elaborate elevation-drawing in preparing the drawings for a building are well known, and perhaps we may take it that his condemnation of geometrical drawings for an architectural exhibition is to some extent coloured by this general opinion. Mr. Waterhouse,

our other R.A. correspondent,* suggests, in accordance with Mr. Jackson's remark, that as this is now the only annual exhibition which has a room devoted to architecture, he does not think that any of the space on the walls should be devoted to sketches of ancient work (however meritorious either the work or its delineation may be), but should be reserved for illustrations of the architecture of the current year, or of the immediate past. He adds:—

"Part of the space might possibly be devoted, with advantage, to the exhibition of geometrical drawings, as, indeed, is the case at present with drawings showing the decoration of rooms; but such drawings hardly give the public so true a representation of buildings as perspective views do when faithfully prepared. Such perspective views might, however, be more frequently accompanied by floor plans than is now the case."

Thus it will be seen that in regard to the geometrical drawing question our two Academy correspondents differ considerably.

Having naturally given those within the Academy the first place, we will now proceed to notice the opinions of some of our other correspondents. Mr. Belcher considers that the problem of selecting exhibits for the Architectural Room must be a difficult one for the Academy, partly because architectural draughtsmanship has so much advanced of late years that it is not surprising if it often glorifies that which is unworthy. He continues—

"Bearing in mind that the exhibition is for the public the work should not of necessity be technical or educational. I certainly think that geometrical elevations should have their place, and are in many cases more effective than so-called pictorial representations. When plans and sections are attached they should be subordinate. I am, of course, aware that the plans and sections are of equal importance with the elevation to the architect and student, but a public exhibition of them at Academy exhibitions appears inappropriate; I prefer to see them in the *Builder*."

Another opinion of very opposite tendency comes to us from the same address, in a letter from Mr. A. B. Pite, which is one of the ablest communications on the subject that we have received, and we may quote the greater part of it. Mr. Pite says:—

"In reply to your letter as to the Royal Academy Exhibition of Architectural Work, I feel that the present exhibition arrangements are very unsatisfactory, and may be regarded as having exercised a limiting and prejudicial effect upon architectural drawing as an art, and upon public taste in such matters."

It may be said that the executed building is the true exhibition of the architect's art, but that is not the case, as it exhibits a great deal more in most cases—e.g., builders' workmanship, false effects, owing to newness of materials, &c., &c. The means by which the architect expresses his design and by which it is executed are the true test of his skill and usefulness in his art and generation.

Architectural art demands a thoroughness of detailed treatment and a consistent harmony of design in every phase of the building, and these qualities are brought to the test and exhibited only in the complete 'set' of drawings, and these are consequently essential to the proper illustration, as well as execution, of a work of architecture nowadays. Artistic harmony and constructional thoroughness can, in such circumstances, be duly weighed with each other, and all the factors of plan, section, elevation, detail, and perspective be considered in proper relation. I feel very strongly that no architectural exhibition is worthy of the name without architectural drawings as such forming the bulk of the exhibits: the sketches, perspectives, and isolated geometrical drawings of the current exhibitions being wretchedly unsatisfying.

A large increase of space for exhibition is required at the Royal Academy in order that such a reform may be effected. . . . The illustration of complete sets of drawings will not, I believe, prove to be uninteresting to the art or picture-loving public, or generally unpopular, as there is a typical regard for workmanlike quality and thoroughness in every art or science, and industrial exhibitions may be cited in

illustration of this. A great stimulus will be thus given to sound architectural drawing and workmanship, and to fair and square draughtsmanship, that will exercise a beneficial effect upon the daily work of architects and a reflex influence on public opinion."

Mr. R. T. Blomfield considers the present exhibition unsatisfactory inasmuch as it "induces architects to devote themselves to the manufacture of picturesque drawings." (This is perhaps hardly correct, since it is part of our complaint, and that of many of our correspondents, that these "picturesque" drawings are made by proxy). Mr. Blomfield thinks any change would be welcome which would recall attention to the fact that architecture deals with design and has exceedingly little relation to mere draughtsmanship. He thinks the architectural exhibits should be limited to photographs of executed buildings and to geometrical drawings, and if there are perspectives they should at least be autographs of the architect who is responsible for the design. He adds, however, that it is probable that architecture would gain as a fine art if architects trusted to their buildings alone and did not trouble their heads about exhibitions, and that draughtsmanship is responsible for some of the exuberance of modern architectural detail. But then, if we are not mistaken, Mr. Blomfield considers all ornament on a building as an "exuberance."

Mr. J. M. Brydon writes:—

"In the first place, the room is too small for its many requirements, for not only is architecture proper shown there, but much of the space is given up to sketches of old work, designs for stained glass, and other decorative subjects. I am far from saying that decorative art should not be well represented at the Academy—quite the contrary—but if the architectural work of the year, or the time, is to be adequately displayed, then the whole of the present gallery should be given up to it."

Drawings of old work, and of the arts related to architecture, which are most interesting, might be relegated to another gallery—say, No. 9 on the plan in the Catalogue—a gain, I should think, to the exhibition as a whole. For an 'Academy of Arts' there are far too many galleries given up to purely easel pictures."

Secondly, while I think that pictorial representations of buildings, as at present, should be retained, they should certainly be supplemented by plans, elevations, and sections on such a scale as to be easily read, and which need not necessarily be glazed; and also by photographs of executed work. If models are to be introduced, as this year, then the present gallery, even for purely architectural work, will soon become far too small."

Another correspondent, Mr. Prothero, expresses the opinion on the contrary that the present Architectural Room fails "because it lacks variety," the room allotted to it being also too small and out of the way. He says:—

"What one would like to see would be a bigger and more central room, a larger proportion of working drawings, more sketches by the designers themselves, more models; and in the case of small objects, e.g., of metal or woodwork, the thing itself would be of more interest than the drawing. In the same room needle-work, tapestry, and stained-glass might very well be shown."

Mr. Caröe considers that we owe the Academy a debt of gratitude as being the only body which has attempted to bring architecture before the public, while admitting that the result is unsatisfactory, mere draughtsmanship often bearing away the palm from the less attractive portrayal of even brilliant design. At the same time, a knowledge of the public taste does not warrant a belief that an exhibition formed entirely of working drawings would receive a larger share of the public support "to which the Academy naturally looks for subsistence"—

"Yet I hold that working drawings (of which a plan must be an essential part) form the *only* proper means of exhibiting architectural design. But if these alone are not sufficiently explanatory or attractive to the public, they may well be amplified by photographs from the building itself (and the brightest sun does not 'cook' our proportions or grouping), or by slight perspective drawings, rather illustrative than elaborately pictorial, if the building does not yet exist in fact."

At the same time I should be the last to desire the abolition of brilliant architectural draughtsmanship from the walls of the Academy. Might not this be

secured by reserving a separate room for the draughtsman's works, where also drawings of ancient examples might be hung?"

Mr. Caröe's rather ominous suggestion that the Academy "depends for its subsistence on the favour of the public opens a pretty large question. We had been under the impression that the supposed object of the existence of an Academy of Arts was to promote the advancement of art—in other words, to teach the public something and to lead their taste. Mr. Caröe appears to assume as a matter of course that its object is merely to cater for the public taste. In that case we should like to know on what grounds it receives State support. The fact seems to be that the Academy insist on a small representation of architecture—sculpture, water-colour, and black-and-white, in order to give them their title of "Academy of Arts," but they refuse to represent them properly. A curious light is thrown on this point by a rough calculation of the perimeter of the space allotted to the various branches of art represented, which gives the following result:—

	feet:
Oil-paintings	1,421
Sculpture	206
Architecture, stained glass, &c., . . .	116
Water-colour, pastel, and miniature	136
Black and white	80

Need more be said? The oil-painters are the majority in the Academy, and practically they make all the laws.

Mr. A. T. Bolton observes:—

"No one who has seen the Salon can consider our Architectural Room satisfactory. We want space without limit, so that whole sets of strainers of competitions and actual work can be displayed, and no frames and glazing are necessary, and very little get-up. Large detail drawings sufficiently coloured in a good, if rough, style would have ten times the educational value of the views, which every year get smaller, as smallness is now considered to be a tip for a place. To my mind it is idle to consider the public, as is now attempted, seeing that few or none ever enter the room. No other plea could justify the present show. What is really interesting and instructive is the R.I.B.A. January exhibition, but that has the defect of not including the work that is actually being built."

Mr. Ricardo does not consider the present representation of architecture at the Royal Academy satisfactory. He says:—

"The examples are chosen with a view to interesting the amateur of architecture—not the student—and, consequently for the most part, for qualities of representation and draughtsmanship that are not necessarily present in the executed work. I think it is the function of the Royal Academy to determine what is *fine* architecture, and to exhibit such work in an encouraging and instructive manner to the practitioner and the education of all those who are seriously interested in architecture. This would mean the exhibition of plans, geometrical elevations and sections of buildings, to the exclusion (mainly) of perspectives, but permitting sober photographs. To hang such a quantity of frames—and to hang them all at a reasonable distance only from the eye so that they might be studied—would require probably three or four rooms in place of the one at present devoted to the purpose. This, owing to the state of enthusiasm for architecture is, I admit, too much to require during the summer exhibition. But it is necessary that the architectural exhibition should be contemporary with the oil painting? I would suggest that it should be held in the winter, during the reign of the 'Old Masters,' at which time there would be no difficulty in allotting the requisite quantity of space."

Another correspondent, who does not wish us to quote him by name, considers that "plans, elevations, sections, and 4-in. scale details would be a fairer representation of the actual building (and be the real work done in the office) than the pictorial representations made by outsiders who have never had anything to do with the real study of the design."

Mr. Robson does not see how the representation of architecture at the Academy can ever be satisfactory, or conduce to the real advancement of architecture as a fine art, as long as art is constantly treated there as though it were limited to the painting of pictures, and the work of architects judged merely on that basis:—

"If drawings were selected less on the score of showy draughtsmanship, and more on grounds of

* We wrote to all the seven architect members of the Academy except one, considering that they might have individual opinions on such a subject, apart from the opinion of the Academy in its corporate capacity. Of these, Mr. Jackson and Mr. Waterhouse, as observed, have replied: of the remaining four, one is out of England; one replies that he does not, as an individual member of the Academy, wish to express an opinion on the policy of the Academy in regard to any part of its exhibition (a position which of course we quite understand); and the remaining two have not replied, perhaps for the same reason.

† In London, we presume, Mr. Waterhouse means. There are two or three provincial annual exhibitions where space is regularly devoted to architecture; those of Glasgow and Liverpool at all events.

scholarly planning and artistic design, I think better results would be attained. We should less often see the places of honour given to splendid drawings illustrating mediocre architecture.

In my view, therefore, anything which would enable architects to exhibit representations of their work in such manner as they, themselves, might prefer (of course, within certain limits) were admitted, and it were not forbidden to submit plans, elevations, and sections—and even photographs—we might hope to see an impetus given to architecture such as has, under the President's initiative, already been given to the sister art of sculpture. . . . Among other things we might ponder well the Frenchman's dictum that *planning* lies at the root of all good architecture.

Until this last is recognised, I fear we shall not get far beyond the cabinet-maker's masonry, and the terra-cotta abominations which are the vices of the day.

Mr. A. H. Skipworth, after repeating the usual expression of dissatisfaction, adds:—

"I am certainly in favour of much greater prominence being given to geometrical elevations, plans, and sections. Why, too, should the everlasting gilt frame be applied to the architectural section?"

The space allotted is obviously inadequate. I have always thought that part of the lecture-room could be given up to architecture. The drawings might be hung on the walls not higher than 9 ft. from the floor, or on both sides of screens arranged in a convenient manner."

Mr. A. E. Street says that:—

"As far as architects are concerned the interest and value of the Architectural Room would be increased if exhibitors were encouraged, as they were at Liverpool lately, to show their buildings as they really are, by admitting photographs of existing works, by laying stress on the importance of every representation of a building, whether pictorial or geometrical, being accompanied by a plan, and by declining to accept good draughtsmanship as a complete substitute for good design, when the work illustrated has no intrinsic merit of its own."

Mr. Percy G. Stone suggests the following as the steps he should propose in order to improve the representation of architecture at the Royal Academy:—

1. A preference being given to strictly 'architectural' drawings and to work actually executed.
2. That drawings of old examples and 'sketches' should not be admissible.
3. That designs for the allied arts should be shown on screens in the centre of the room.
4. That a limited number of models be admitted.
5. That there should be some systematic grouping of the designs under their respective heads.
6. That a more dignified position should be found for the exhibits.

I certainly think more prominence should be given to geometric drawings. Merely 'pictorial' work does not, in my humble opinion, 'represent' the dignity of architecture."

Mr. Stone adds also that designs for stained-glass and surface decoration do not represent architecture, and that the height of incongruity seems reached in No. 1,552, "Design for a Christmas Card."

Mr. E. P. Warren seems to be of the same opinion on this last point: he says, "I should like to see designs for stained-glass, painted friezes, and sketches of old work relegated to another room, say to the existing little chamber; they should not be mixed with architecture." The point of this remark however will hardly be appreciated apart from the other recommendations in Mr. Warren's letter, which is a pretty drastic one:—

"I think the existing method of exhibition at the Royal Academy, as applied to architecture, and the arrangements which accompany the method, not only absurdly inadequate, but ludicrously unworthy of the representative artistic body of a great nation and of the dignity of the art in question.

The room allotted to architecture is preposterously small—even in relation to the size of the Academy building. One of the larger rooms should be given up to architecture, or architecture and sculpture combined; and with the probable increase of architectural models as exhibits, this will soon become absolutely necessary.

With regard to the drawings exhibited, I am strongly in favour of plans, elevations, and sections, with a sparing use of 'perspectives'—such as bird's-eye views and marginal sketches to illustrate them. I deprecate the absurd and unworkmanlike smartness of the average exhibit—the illusive pictorial 'perspective'—and should like to see working-drawings on strainers, without glass or frames; they are to be seen frequently in the Paris Salon. [Glazed architectural drawings are almost unknown at the Salon.—Ed.] I would go further, and permit the use, under restrictions, of photographs, as appendages to plans of executed buildings; and

would welcome models of all sorts—of whole buildings, or of portions of them, and casts of ornamental details."

Mr. Rowland Plunbe reminds us that he, along with Mr. R. W. Edis, was Secretary to the old Architectural Exhibition in Conduit-street, his experience in connexion with which led him to believe that the public took little interest in architectural drawings, and his observations in the Architectural Room at the Academy lead him to the same conclusion now. He continues:—

"Therefore, although I do not consider the present exhibition of architecture at the Academy satisfactory, yet I do not think the authorities, in the present state of public appreciation of our art, can be expected to devote more space, and in view of my experience I should hesitate to claim more. I think if we did, we should not be likely to get it.

I should certainly personally favour the introduction of geometrical drawings, including plans and sections, but here again looking at the probable demand there would be for such drawings on the part of the public, I should hesitate to demand the exhibition of the same. I have rather come to the conclusion that the exhibition of perspective drawings of the actual work of the time is not exactly what the Academy wants, but that they rather desire pictorial and picturesque work only, as distinguished from a representative exhibition of drawings of the buildings that they are in contemplation, or in course of building, at the time of the exhibition, and it is, therefore, only on the rarest occasions that I venture to send in a drawing. There may be a possible demand on the part of architects themselves for an exhibition of architectural drawings, but considering the full and ample way in which buildings are illustrated in the professional papers, I doubt it."

Mr. Emerson takes rather the same line. He says:—

"Considering the small general interest taken in architecture, proved by the usual emptiness of the room devoted to its exhibition, I should say the space given is ample, especially as one half is generally occupied by sketches, non-serious work, or designs never likely to be executed.

But I certainly am of opinion that it would be advantageous if more geometrical drawings were admitted."

Mr. H. O. Cresswell considers that the present architectural exhibition at the Academy is anything but satisfactory:—

"If architecture is to be represented there at all it should be by proper geometrical drawings, plans, sections, &c., supplemented by perspectives; or, perhaps, better still, by photographs of the actual work. This would give anyone who wished to know something about a design the opportunity of doing so, which the present system of pretty pictures does not. . . .

Perhaps if this system were employed more largely we might in time induce the Academy to see that it is the *design* which is the thing, and that mere pictorial effect is quite a secondary matter, especially when, as is usually the case, the picturesque accessories are mostly imaginary, and the invention of the clever draughtsman who is employed to prepare the perspective.

Of course, in considering this question one must bear in mind that the ordinary public do not care a rap for architecture or architectural drawings, and that the Architectural Room is to them a blank, and is likely to remain so, whatever means are adopted to illustrate our work."

In regard to this last pessimistic conclusion we may say that, however true it has been up to this time, we hope better things, and we are inclined to think that there is already a sign of improvement, and of some little stirring up of interest in the subject on the part of the public—slight enough at present, no doubt, but which may be capable of further development if the architectural exhibition at the Royal Academy can be put on a better basis and arranged on a more systematic principle.

Next week we will print extracts from some more of the letters we have received on the subject, and will add our own summary of the conclusions to which they appear to point.

THE NEW ROMAN CATHOLIC CATHEDRAL AT WESTMINSTER.

THE cathedral, the foundation-stone of which was laid by Cardinal Vaughan on Monday last, will be erected from the designs of Mr. John F. Bentley. Mr. Bentley is best known by his Gothic buildings, such as the new

Catholic Church at Walford, the Preparatory College at Beaumont, and the seminary erected for Cardinal Manning at Hammer-smith. The refitting and decoration of the churches of St. Botolph, Aldgate, and St. Botolph, Bishopsgate, however, show Mr. Bentley to be thoroughly at home with the Renaissance style. And we think it will be acknowledged that the difficulties of the Byzantine style have been overcome in the very striking design for Cardinal Vaughan's cathedral. It is true that the design is in the little more than a sketch condition, but the sketches bear promise of a work of singular interest and originality.

The first idea was to build the new cathedral in imitation of "Old St. Peter's at Rome," and Mr. Bentley spent several months in Italy at Rome, Ravenna, and other Italian cities, studying the early "Basilica" churches. Although immensely interested with these ancient and beautiful buildings, he came to the conclusion that they were not suggestive of modern treatment, or specially applicable to modern requirements, especially for a London church; much of their beauty depending upon columns and features derived from other buildings, combined together in such a way as to produce that fascinating picturesqueness so attractive to the pencil of the painter, but so unattainable in a modern building, even where much is sacrificed to pure archaeology. Then the great wooden roofs of these buildings point to a kind of make-shift construction, which has been seen in our own time at St. Paul's, Rome, renders the building an easy prey to fire, and it is certainly absurd at the present day to cover the walls of a building with rich and costly decoration without attempting to render it fire-proof.

On the other hand, the churches of St. Mark, Venice, the cathedral at Murano, St. Vitalis, Ravenna, and St. Ambrogio at Milan seemed to Mr. Bentley to offer admirable suggestions for modern church architecture, especially in a case where it was considered inadvisable to copy the Gothic of the thirteenth, fourteenth, and fifteenth centuries, so Mr. Bentley determined to advise his clients to give up the Basilica idea, and it is greatly to the credit of Cardinal Vaughan that he consented to do this, as it is an example of that kind of understanding and confidence which ought to exist between client and architect, but which, unfortunately, is too frequently absent.

The general idea of Mr. Bentley's scheme is a vast nave of 60-ft. span and 280 ft. long, covered by four segmented domes, supported upon semi-circular arches, which rest upon vast oblong piers set at right-angles to the axis of the nave. Three out of four of these great square bays will be subdivided into two by arches, which will give a subsidiary pier between the great ones, a treatment which may be seen at St. Ambrogio at Milan, Spirens and Worms cathedrals, &c.

The clearstory does not rise above the inner wall of the aisles, but above the outer ones, so that the aisles are practically *inside* the nave, and are made to support galleries. A second subdivision takes place in the aisle arcades, so that there are four arches opening into the aisles from the nave in each bay. The great piers, which are the whole depth of the aisle, are pierced through both at the level of the aisle and of the gallery. A row of large chapels flanks the aisles to the north and south.*

The fourth bay is not subdivided, but its galleries are so, and in the third bay the pilasters are lengthened out in a north and south direction, so as to form transepts vaulted in two spans of barrel vaulting.

The fourth bay will form the sanctuary of the church. The high-altar, which will stand near to its eastern extremity, will be placed beneath a simple baldacchino of very early form, and stalls for the canons, clergy, and assistants will be ranged along the sides

* We are here speaking as if the church was built east and west, but, in point of fact, the axis is across the cardinal points of the compass, as in so many of the Italian churches.

near to its western end. The throne for the Archbishop will be on the north side, east of the stalls.

To the east of the high altar will be the monk's choir, it will open into the church by an arch about 60 ft. high (the extreme height to the vaulting of the nave measuring into the domes will be 105 ft.). The monk's choir will be raised upon a crypt, as at St. Ambrogio at Milan, and will contain stalls for forty ecclesiastics; this choir will be roofed with a barrel-vault, and will terminate in an apse. The crypt will be visible from the nave, and will open into the canon's choir by four arches, as at St. Ambrogio and at San Zenone, Verona.

Between the two choirs, just behind the baldacchino, there will be suspended an immense wooden cross upon which the Crucifixion will be painted; in fact, nearly all the decoration will be *flat*, the only carving used internally being in the capitals, which will be very rich and in deep relief. As high as the galleries the church will be lined with slabs of marble set so as to reverse the grain, but above this the whole will be encrusted with mosaics, partly figure work and partly in arabesque: upon the flanks of the great pilasters there will be inscribed marble slabs, so that the pictures above them may be either monumental or "votive" gifts. The baptistry will be at the west end of the south aisle, and a lofty campanile, 30 ft. square and 300 ft. high, will stand at the north-west corner. The great doorway will be very deeply recessed and adorned with carving and sculpture, but the rest of the exterior will be simply and plainly treated, and constructed of alternate bands of stone and red brick. A rather striking and very large staircase turret will stand at the corresponding situation to the campanile. Every effort will be made to get the structural portion of the building completed as soon as possible; the mosaics will be carried out as funds accumulate for that purpose.

Although some may regret that the church is not to be Gothic, yet we are of opinion that the experiment of attempting to apply the Byzantine style to modern church architecture is both valuable and judicious, as it lends itself to mosaic or painted decoration far better than any other style of building, and can be made effective without cutting up the great spaces; cornices and mouldings can be dispensed with, and those sunk panels which drive the decorative painter mad, as they are certain to cling to the figures in such a way as to make them look uncomfortable, may be omitted. We shall watch this new departure in ecclesiastical art with considerable interest, and probably give notes and sketches from time to time.

NOTES.



AT University College there is a whole gallery at present filled with objects of what Dr. Petrie is pleased to call a new race; a race which flourished about 3,000 years ago, and which then passed away. The sepulchres and the tombs have been made to reveal, by excavation, the history of this hitherto unknown people, and the mass of objects of all kinds spread out for inspection show to some extent what kind of men they were. That they were foreigners to the soil of Egypt, and indeed, apparently to Africa, is plain enough, for a series of human remains exhibited show clearly enough that the facial features possessed none of the traits either of the negro or of the Egyptian. The articles used in their daily life, too, are not Egyptian, and a spectator must be struck with the remarkable differences between what is exhibited and those of Egyptian origin which have been shown at previous exhibitions. Here are great numbers of pottery objects, not turned on a wheel, as was the case with the pottery of the still earlier Egyptian race whom these "new people" supplanted, but all made by hand. There is bright red ware; other objects have a dark metallic tint at the tops; others have painted spirals on a dull

brick-colour ground. There is visible, indeed, a progress and a decadence in the articles which goes to prove the long continuance of the race. The personal ornaments are all of novel form, and of much interest to ethnological students, who have in these objects an admirable field for the study of resemblances and differences with the works of people widely remote from Egypt. A rudely-made vase in the form of an animal would be considered as of Peruvian make but for the known place of its discovery. The site of the discoveries is about thirty miles north of Thebes. The collection is open free from ten until six, and it will continue open until July 27. A clearly-worded catalogue, sold at the moderate price of sixpence, affords lucid information as to the discoveries, pending the publication of a more ample description. Not only are the objects discovered by Dr. Petrie exhibited, but also those found in the same district by the new Egyptian Research accounts. As on former occasions, the liberality of Mr. Jesse Haworth and Mr. Kennard has been the means of procuring this important addition to the history of Egypt.

THE Prime Minister cannot be altogether congratulated upon the appointments in his Government with which the readers of this journal are chiefly concerned. The First Commissioner of Works, Mr. Akers-Douglas, is, no doubt, an admirable political organiser and an excellent party "Whip." But he has had no administrative experience, and has never shown any indication of gifts which would fit him for his new position. The appointment again exemplifies the need for the establishing of a non-political Council to control the public buildings of London which are under the control of the Government. When we come to the Local Government Board we find Mr. Chaplin as President, and Mr. T. W. Russell as Parliamentary Secretary. Mr. Chaplin is a Tory of the old school, and we cannot think of him as having sympathy for sanitary progress, nor has he ever shown any vigour as an administrator. Mr. T. W. Russell is well known as a striking platform speaker on political subjects, but he has certainly never given special attention to many of the subjects which are under the control of the Local Government Board. But as he is vigorous and fearless, we hope that he may not allow any slackness on the part of his office.

EARTHQUAKES in Great Britain, though fortunately infrequent and seldom formidable, should be systematically studied and recorded, in regard to intensity and direction of shock, time of occurrence, and other circumstances connected with them, in order to throw additional light on this class of phenomena, especially as affecting our own country. With this object, Mr. Charles Davison, of 373, Gillott-road, Birmingham, has been for some time collecting and formulating all the information he has been able to obtain from the experience of those who have felt and observed earthquake shocks in this kingdom. In order to aid in the more careful observation and description of earthquakes, Mr. Davison has drawn up a short paper of suggestions which he will be glad to send to any one who wishes for it, and will communicate with him. He observes that the points most worthy to be attended to are the following:—1. Name of the place where the shock was felt; 2. Day and hour at which it was felt; 3. Nature of the shock; 4. Whether it was strong enough (a) to make doors, windows, fire-irons, &c., rattle, (b) to cause the chair, &c., on which the observer was resting to be perceptibly raised or moved, (c) to make chandeliers, pictures, &c., swing, or to stop clocks, (d) to overthrow ornaments, vases, &c., or cause plaster to fall from the ceiling; 5. Whether the shock was accompanied by any unusual rumbling sound." We should have been disposed to add, direction in which the shock appeared to travel. In the only at all marked shock of

earthquake which the writer remembers to have experienced in recent years in England, the direction of travel of the disturbance was quite recognisable, the sound made by it being heard approaching from one quarter and receding in the opposite quarter. This was in the middle of the night, when the rumble of the earthquake before the shock was actually felt was much more audible than it would usually be in the daytime.

THE business meetings of the International Railway Congress commenced on Monday, but that day was mainly spent in preliminaries of organisation. On the two following days the subjects mainly considered were the settlement of disputes, acceleration of goods traffic, the contributive traffic from light railways, and the question of the general adoption of a twenty-four-hours day. This latter subject is of interest to all travellers and to all engaged in correspondence and telegraphing to distant places. In a report circulated among the members, drawn up by Messrs. Scolarini and Rocca, appointed for the purpose by the St. Petersburg Congress, it is stated that a time-day from 1 a.m. to 24 o'clock at the succeeding midnight was adopted forty years ago in the kingdom of Sardinia, and United Italy adopted it in 1893. The twenty-four-hour notation has been in use on the Canadian lines for several years, and for a much longer period on the East Indian railways; but in the United States, in spite of a vigorous agitation in its favour, it has not yet been adopted except on the Union Pacific and Florida lines, but the American representatives believed they could get it adopted at once in the States if a vote of the Congress were given in its favour. The Western Union Telegraph wrote that the adoption of the system would greatly reduce the risks of error, and "would save the transmission of 150,000,000 letters annually." The afternoon of Wednesday was spent by the members in excursions by railway to Southampton, Battle, St. Leonard's, Hastings, and Canterbury. A reception at the Imperial Institute on Tuesday evening was very largely attended, and the great quadrangle of the building was glorious with myriads of coloured lights, presenting a beautiful effect. The Hungarian band performed in the main hall, and Strauss's band in the quadrangle; refreshments were provided on a liberal scale, and the whole thing was very well done.

THE annual Congress of the British Archaeological Association, which will take place in the week commencing Monday, August 12, promises to be of considerable interest. The first meeting will be held at Trentham, when the members will inspect the site of the ancient church, and visit Trentham Hall, and an early earthwork on the Duke of Sutherland's estate. On Tuesday headquarters will be at Leek, and the Cistercian Abbey of Dieu-le-Cress will be visited. On the Wednesday Lichfield and Tamworth will be the centres, the main objects being Tamworth Castle and the Church of St. Editha, and in the evening, at Stoke, Mr. E. Loftus Brock will read a paper on "Old Staffordshire Pottery." On the Thursday the neighbourhood of Hawkstone will be inspected, including the supposed Roman camp site at Chesterton, Heighley Castle, the British camp known as Bay Walls, &c. On the Friday visits will be made to the castle and British camp at Alton, and to Croxden Abbey and Checkley. On the closing day attention will be given to Thorpe-Ilam, and Blore, including the churches and pre-Roman crosses at Ilam.

THE Architectural Association Excursion, which starts on the same day, will be mainly a Gloucestershire excursion, and promises to be a very interesting one. On the first day Southam and Portliff Manor House and Bishop's Cleeve Church will be visited; on the Tuesday Tewkesbury, and Strensham Church; on the Wednesday Chastleton, a

very interesting old mansion; on the Thursday Broadway, Buckland, Stanton, and Stanway; on the Friday Sevenhampton, Charlton Abbots, and Winchcomb, and on the concluding day Gloucester Cathedral, as well as houses of interest in Gloucester.

WE have received, by the last mail, particulars of some experiments which are now being carried out in America, for the purpose of ascertaining the relative crushing strength of machine-mixed and hand-mixed concrete. So far the results are undoubtedly surprising. Hand-made concrete (1 cement to 12 aggregate), at the age of one week, was only one-half the strength of concrete which, in addition to the hand-mixing, had been turned 50 times in the mill, and only one-third the strength of that which had been turned 350 times. Sufficient tests have not yet been made to settle the point conclusively, but further experiments, extending over some months, are contemplated, and we hope to be able to give our readers full particulars in due course.

THE last circular from the Emigrants' Information Office reports very badly of the demand for labour in most of the Colonies, especially in regard to operative trades. Whether in Canada, Australia, or South Africa, the report is the same—"no demand for mechanics." The Superintendent of the Government Labour Bureau at Sydney recently reported that there were from 8,000 to 10,000 persons unemployed in that city and the suburbs, and that others in search of employment were coming in from country districts. In New South Wales the long-continued troubles at the collieries are at last settled to all appearance, the miners having resolved that all strikes should cease, and that terms should be made with the employers. This is almost the only favourable news in a generally very discouraging document. It is clear that emigration to the Colonies offers no outlook at present for superfluous labour in the building trades.

IN his last four-weekly report on the sanitary condition of Kensington, Dr. Orme Dudfield draws attention to the provisions of the compulsory section [60 (4)] of the Public Health (London) Act, which enforces on the Sanitary Authority the duty of providing, free of charge, temporary shelter or house accommodation, "with any necessary attendants" (we confess we do not understand the precise drift of this rather vague sentence), for members of a family in which any infectious disease has appeared, and who have been compelled to leave their dwellings for the purpose of their being disinfected by the Sanitary Authority. Dr. Dudfield states that he called the attention of his Vestry to this subject as long ago as 1890, but that nothing has been done. In December last the Medical Officer of Health to the London County Council prepared a return showing how far this provision had been carried out by twenty of the District Sanitary Authorities of London, but urging that as the disinfecting process generally occupied many hours, the temporary shelters, to be efficient, must provide for night occupation and sleeping accommodation, and that in many of those already provided this was not the case. Dr. Dudfield goes on to state that during the year 1894 some sixty-four cases of infectious disease occurred in families occupying single rooms, which rooms were closed for twenty-four hours, necessarily putting a number of poor persons to great inconvenience. It is to be hoped that the Kensington and other Vestries will recognise the importance of this subject, and also bear in mind that they are bound by law to provide this accommodation. To this fact some of them seem to be alive, though not in the right spirit, as it appears from Dr. Dudfield's report that while he is urging compliance with the law on his own Vestry, a circular letter has been sent to various Vestries inquiring if they are in

favour of the repeal of the enactment in question, with the evident object of getting up an agitation to get rid of a responsibility which the State has very properly imposed upon them.

FOR some three or four months past the Manchester, Sheffield, and Lincolnshire Railway Company have been busy with a demolition of property which obstructs the course through Marylebone and Hampstead parishes of their extension line to London. In their Act of 1892 were scheduled what is known as the Boscobel-gardens site, Alpha-road, Lorne-gardens, and Grove-gardens (formerly South Bank), together with Blandford-square, Harewood-square, Boston-street, Balcombe-street, and many other thoroughfares in that neighbourhood. The school-house, next east of Lord's Cricket Ground, of the Clergy Orphan Society is now nearly destroyed; similar clearances are being made along the western side of Wellington-road, and between Marlborough Hill and Loudoun-road, and along that same side of the Metropolitan Railway line up to and including a large portion of Broadhurst Gardens, at West Hampstead; the entire north side of Grove Gardens has been pulled down, together with the eastern portion of North Bank (north side), for the diversion of that thoroughfare by a new road to enter Lodge-road. With the two squares we mention above will disappear the two homes of Sir George Hayter, painter, and of George Eliot. The latter, with Lewes, took, in September, 1860, a furnished house, No. 10, Harewood-square, whence, after three months or so, they removed to No. 16, Blandford-square, where "Romola," "Felix Holt," and "Silas Marner" were written. In November, 1865, they went to the Priory, North Bank, where they remained until Lewes's death in 1878. In that interval George Eliot composed "The Spanish Gypsy," "Daniel Deronda," "The Legend of Jubal," "Theophrastus Such," and "Middelmarch." After G. H. Lewes's death she quitted the Priory, and with her husband, Mr. Cross, resided for the last two years of her life at No. 4, Cheyne-walk, Chelsea. At the Priory, which is not yet dismantled, her study was on the upper floor, Lewes's on the floor beneath. We gather that the new line will run in two tunnels, side by side, for the portions between Broadhurst-gardens and Circus-road, and between Wellington-place and Lodge-road, thus passing beneath the addition of 8,640 square yards, that is to be made to the M.C.C. Cricket Ground, and beneath the site of the former field, by the "Eyre Arms" Tavern, where was held a rehearsal of the Eglinton tournament, 1839. Lough, the sculptor, lived in Harewood-square; No. 41, Alpha-road was the last home of Lamb's sister, Mary; in South Bank Voelker, with Bentham's help, opened the gymnasium, which he afterwards transferred to what was then No. 1, Union-place, New-road (now opposite Marylebone Church), and of which Cruikshank made a sketch for Hone's "Every Day Book," vol. i. On the other hand we notice that building operations have been begun, for six blocks of dwellings, upon the large space which has been cleared between St. John's Wood-road, Grove-road, and Cunningham-place, an area which includes the sites of houses in those three roads, and that of the old Red Hand Farm, or Barn, in which, as altered to meet his own requirements, Sir Edwin Landseer lived from 1825 until his death in 1873.

LETTER FROM PARIS.

ON Monday last took place the annual formal distribution of "récompenses" awarded to artists exhibiting at the old Salon, which, as well as the Champ de Mars Salon, closed on the evening of the same day. This double closing will render a certain number of new works available for their intended positions in the Hôtel de Ville. The "Halles" of M. Lhermitte will find place in a

room—unfortunately too small for it—near the room decorated by M. Binet with scenes of the Siege of Paris. M. Roll's "Joies de la Vie," which gives such a very synthetic view of the possible joys of existence, will go to decorate the large reception salon opposite that of M. Pavis de Chavannes. The friezes by MM. Bonis and Henri Martin will take their places in rooms situated at the ends of the large Salle des Fêtes. This last-named room has just received the large ceiling by M. Benjamin-Constant which has gone through so many vicissitudes. The artist commenced by making a sacrifice to what he considered as the prevailing taste of the day, in a large composition of confused design and far too blue in colour. Then it was objected to him that what was wanted was a work in his own style, and not an imitation of M. Besnard. This time M. Benjamin-Constant himself undoubtedly appeared, with all his special qualities as a colourist, in the glory of a ceiling in which red predominated, and which was conceived in the style of the Venetian ceiling-paintings, and represented "The City of Paris seated on a Trirème and receiving the Nations invited to her Fêtes."

Various artistic works not included in the general scheme of decoration of the Hôtel de Ville, are to be undertaken there shortly, if the Municipal Council approve the recommendations of the Fine Art Committee. One of these is a large allegorical bas-relief intended for the "Siege de Paris" room, the execution of which is to be entrusted to M. Puech. It represents or symbolises a kind of pacific apotheosis of the City of Paris. In the "Salle des Cariatides" M. François Flameng is to execute a series of tympanum decorations symbolising the various quarters of Paris. Lastly, in the galleries called those of "the Tourelles" M. G. Dubufe is to execute a series of cupolas ornamented with figures on a background of verdure.

Besides the works intended for the Hôtel de Ville, the closing of the Salon will also set free the decorative paintings intended for the Mairies of Alfortville, Maison-Alfort, and Bagneux, painted respectively by M. Arus, M. Debon, and M. Pierre Vauthier.

The inauguration took place last week of the monument to Henri Mürger, in that part of the Luxembourg Garden near the Odéon, and not far from the monument to Théodore de Banville. M. Bouillon, the sculptor of the monument to Théophile Gautier, at Tarbes, has executed the Mürger monument, which is composed of a granite stele decorated with carvings of roses, and surmounted by a bronze bust of the poet, a singing bird beside it. It is proposed to put up other busts on this charming site, making it a kind of poets' corner. Théophile Gautier and Hegesippe Moreau will probably be among those thus commemorated.

Last week witnessed the formal opening of the exhibition of Hygiene installed in the Palais des Arts Libéraux, at the Champ de Mars, but which is by no means complete yet. The exhibition is under the patronage of the State, of the Department of the Seine, and of the City of Paris, and was formally opened by the President of the Republic. It is classified in ten main divisions, sub-divided into five groups. The word "hygiene" in itself sufficiently indicates the general scope of the exhibition, which includes exhibits referring to the habitation, to infectious diseases, demography, sanitary statistics, industrial and professional hygiene, to the care of infants, the sanitary quality of clothing, and to physical exercises. We may observe that the organisers of the exhibition have taken the opportunity to render homage to illustrious sanitarians now dead by placing in a conspicuous position the busts of Belgrand, as the originator of the Paris sewer system, Alphand, as the creator of its parks and squares, and Durand Claye, as the promoter of the agricultural utilisation of sewerage.

This exhibition is to be accompanied, it appears, by scientific lectures on sanitary subjects. It may be suggested that the "hygienists" should take this occasion to come to some practical conclusion in regard to the often-debated subject of the "odeurs de Paris," a subject which raises new discussions and recriminations with each annual recurrence of the dog-days. It is unquestionable that on hot summer evenings, when one would gladly inhale at least pure air, the ill-smelling breeze which creeps through Paris is a nuisance which pursues the inhabitants even into the interior of their houses. Sanitary engineers and doctors have for twenty years back complained of this infestation, and the evil increases in spite of the six million francs spent every year on the cleansing of Paris. It seems to have been found impossible, so far, to suggest the remedy for a

discovery of the origin of this nuisance, and whether it arises from putridity absorbed into the soil of Paris itself, or is due to the unhealthy condition of some of the suburbs which are occupied by insanitary factories and industries; but we incline to the latter hypothesis. The factories of manure, of sulphate of ammonia, and of bone-black, situated in the outskirts, are amply sufficient to maintain this state of things. But to these principal causes we must add another, viz., the bad state and choked condition of the sewers in certain quarters. Speaking generally, it is from the suburbs that all the mischief comes, and the responsibility of the situation rests with the Prefecture of Police, which could bring about an improvement by exercising more strict supervision over unhealthy manufactures. In the district between Neuilly and Pantin, from the west to the north of Paris, there are no less than 119 establishments in which unwholesome and putrefying substances are treated and kept in conditions absolutely unsuitable, and often in the open air. Many of these establishments exist in the neighbourhood of La Villette, especially the "Poudrerie Parisienne," where all the off-scouring of the butchers' business is collected; and as in Paris the wind frequently blows from that quarter, the smells are brought directly into the centre of the city by way of the long streets, Rue d'Allemagne, Rue de Flandres, and Rue Lafayette, which form a sort of in-draught chimney in the direction of the Opéra.

It is the business, therefore, of the Prefecture of Police to put into strict application the severe regulations in regard to the establishment and working of businesses which are dangerous, unwholesome, or even simply disagreeable. This is what the sanitarians who are going to assemble at Paris ought to make a formal demand for, so that the foreign visitors who come to Paris for the 1900 exhibition may not make acquaintance with a state of things which is at present a disgrace to Paris.

The City of Paris is going to contribute 20 million francs towards the expenses of the 1900 exhibition, instead of 5 millions, which they allotted to the last exhibition. The military engineers have just been taking down all the small buildings around the fortifications of Paris, on what is called the "Zône de Servitude Militaire." These demolitions, which are not justified by any defensive necessity (especially as, with the modern guns, the Parisian fortifications are absolutely useless), have been much criticised. It is greatly to be regretted that the military authorities have given way to an unfortunate partiality. Whilst they have destroyed without pity the wretched hovels of Gentilly or Glacière, inhabited by very poor people, they have left intact, opposite the Porte Maillot at Neuilly, an enormous panorama, in which M. Poilpot has illustrated the arrival of the Russian squadron at Toulon 1893. It is only a question of a few months, it is true, but the military authorities would have done well to have put off to the same period the demolition of the poor houses, whose occupants are now without shelter. As for M. Poilpot's panorama, destined for the exhibition at Nijni-Novgorod, it is well painted, and represents the visit of President Carnot and Admiral Avelon on board the *Nicolas I.*

The open competition of the "Union Centrale des Arts Décoratifs," for a Collector's Cabinet, has only produced a mild result. Twelve artists took part in it, and the prize was awarded to MM. Georges Rénon and Eugène Morand. Their scheme, however, wants simplicity, union, and purity of taste. Thanks to the generosity of Baron Edmond de Rothschild, the Louvre Museum has had a great addition in the shape of a magnificent Roman silver treasure, which has been recently discovered near Pompeii, at Bosco Reale. This treasure dates from the first century A.D., and is composed of several pieces, excellent alike in their style and workmanship. Especially noticeable is a vase upon which is engraved a dance of skeletons, with the names of Aristophanes, Euripides, and other ancient poets. There is also a peg with a head delicately carved on it. These things are all signed by an artist of the name of Sabainos.

Every year at this time there is an exhibition at the Ecole des Beaux-Arts of students' work from Rome. This year the sculpture leaves much to be desired. We do not care for M. Gass's "Medea," the "Sleeping Virgin" of M. Sicard, or the great composition of M. Octobre representing "Vice and Virtue." One must consider these exhibits as good works by pupils still at school, but wanting entirely in inspiration and emotion. The bas-relief which M. Lefebvre calls "The Avenger" is less commonplace. In painting we

may mention, without praise, the "Jeunesse et Chimère" of M. Laverigne and the "Enterrement de Léon III." by M. Devambez. On the other hand, we must compliment M. Lavalley on his delicately drawn and coloured nude study called "Flora."

In the architectural section we may mention the beautiful studies on the Acropolis of Pergamos sent by M. Poutremoli, student of the fourth year; those of M. Eustache, pupil of the third year, on the temple of Castor and Pollux at Rome; the interesting series of drawings which M. Bertone (third year) has executed at Pompeii and Rome; and finally, the restoration of the Temple of Mars Ultor at Rome by M. Chaussemiche, pupil of the first year. At the Ecole des Beaux-Arts the diploma of "Architecte du Gouvernement" has just been awarded to MM. Gougry, Tussau, Uhry, Fabre, Poupel, Jaboulay, Friedlander, Rousseau, Guichard, Van-Dorsser, Hale, Sottar, de Belie, Van Pelt, Delaunay, Mottar, Gossart, Marquet, and Charbonnier.

There is a talk of a mosque being built in Paris. This building, which is wanted on account of the increase of Oriental population residing in the capital, is being considered by a committee of men, political, literary, and artistic, among whom we may mention the names of the painter Benjamin-Constant, and the architects Ambroise Baudry and Saladin. The latter is the architect of the graceful Tunisian palace which decorated the Esplanade des Invalides in the exhibition of 1889.

Another piece of news will particularly interest the English public, as it is a project to erect a statue to Isaac Newton in Paris. The idea of erecting this monument is due to two members of the Municipal Council, MM. Pierre Baudin and Vorbe, who wish to "make known, and respected the great laws of continuity and solidarity, which make mankind *one* in time and space." MM. Baudin and Vorbe wish that the statue should be erected by an Anglo-French subscription, and they propose to invite England to unite with Paris to honour the genius of Newton, by a scheme which will place the amount of the subscription within the means of the most humble workers in science, in order that the monument might be an essentially popular one, or in their own words "The indestructible symbol of the three-fold union of feeling, intelligence, and industry, and that it may remain among us as a perpetual homage to science on the part of the people at large."

THE CENTRAL LONDON RAILWAY.

The proposed Central London Railway, for the construction of which the public have just been invited to subscribe 2,850,000*l.*, is an undertaking of considerable magnitude, and one which, if carried out, will offer great conveniences to the large number of people living in the West-end. Commencing at Shepherd's Bush, the new railway would run in almost a straight line to the Mansion House, a distance of 6½ miles, passing below the Uxbridge-road, Oxford-street, and Holborn. Like the City and South London Railway, from the Monument to Stockwell, it would consist of two tunnels, placed close together, often at a considerable distance below the surface of the ground.

These tunnels it is proposed to construct by means of a shield similar to that now being employed so successfully at the Blackwall Tunnel, so that no interference with the streets under which the line passes will be necessary, except, perhaps, where the stations occur.

There are to be altogether fourteen stations, that at the Mansion House, the site for which is below the open space in front of the Royal Exchange, forming one of the features of the new railway. Here the Company undertakes to construct, in addition to the station, a subway for foot-passengers, connecting together the various streets terminating near this point. This, of course, will be an immense improvement, since it will afford greatly increased facilities for the pedestrian traffic.

Electricity is to be the motive power, it being now demonstrated that this is more economical and better suited than steam for such purposes. At the last meeting of the shareholders of the City and South London Railway it was stated that the cost of electrical traction on their line was rather under fivepence per train mile, and this compares very favourably with the cost of steam-power, which amounts to about ninepence per train mile on the large railways throughout the kingdom.

The new railway will no doubt benefit by the experience gained in the construction and working of the City and Southwark Railway. For

example, one of the minor points which that railway illustrates is that even a divided tunnel and electric traction do not ensure perfect ventilation, although the atmosphere is much purer than that of the old underground railway. They will also have the experience gained in the constructing of some 3,000 ft. of the City and Waterloo tunnels, and will not fall into the error of assuming that they can burrow, even at a depth of 100 ft., under private buildings with impunity.

The tunnels of the new railway will be larger than those of the City and Waterloo, and this compels the constructors to build one of them underneath the other when they are under the narrow streets of the City. Shepherd's Bush is at present a centre from which a great many tramway lines radiate; hence, people living at Acton, Hammersmith, &c., will be able to travel the first part of their journey in the open air, and then by electric underground where the crowded streets make tramways impossible. We understand that the trains are to succeed each other every two or three minutes, and that a uniform fare of 3d. for first-class and 2d. for second-class passengers will be charged.

It, of course, remains to be seen whether the new undertaking will be a commercial success. The traffic throughout the day is likely to be of a much more uniform character than that carried by the City and South London line. The financial prospects of this latter company have, however, considerably improved lately, the directors being able to pay a dividend of 14 per cent. last year on their consolidated ordinary stock, this distribution being double the amount available for this purpose for the preceding twelve months.

SKETCHES OF AMERICAN HOUSE ARCHITECTURE.

THESE two sketches, by Mr. E. Eldon Deane, furnish illustrations of the type of picturesque small house in which the American architects, of late years, have shown so much versatility. They are from the designs, respectively, of Mr. W. R. Emerson and Mr. Sidney V. Stratton.

The circular block in Mr. Stratton's house, partially carried on rude stone columns in the ground story, has a great deal of originality of effect. It may, perhaps, be questioned whether such a form is very convenient for the arrangement of the rooms internally, but it is, at all events, an agreeable variety in the treatment of a house.

ARCHITECTURAL ASSOCIATION SUMMER VISITS:

II.—AUDLEY END.

BETWEEN thirty and forty members of the Architectural Association visited Audley End on Saturday last, under the guidance of Mr. Francis Hooper, to see what remains of the famous house erected in 1603 by Thomas, first Earl of Suffolk, and called by him Audley End in honour of his maternal grandfather, Sir Thomas Audley, K.G., afterwards Lord Chancellor and Baron Audley, of Walden. Although a comparatively small part of the original building, the existing work at Audley End is sufficient to establish a high place among the great houses of the early English Renaissance, the hall especially being one of the finest of its type. The house occupies the site, and was paid for out of the revenues of the wealthy Benedictine abbey, originally established as a priory by Geoffrey de Mandeville, Earl of Essex, in the reign of King Stephen, and part of the old monastic establishment, now called the Priory, is still extant in the agent's house.

After seeing Audley End, the return was made through the neighbouring town of Saffron Walden, a town which, for its size, contains an exceptional amount of interest for the architectural visitor. Modern work by Norman Shaw, Nesfield, and Edward Burgess, many examples of old plaster and half-timber work, and a very fine church of fifteenth and sixteenth century date, furnish a varied and sumptuous bill of fare for the sketcher and student, and the far end of a Saturday afternoon seemed all too short for those who would fain have lingered, but had to return to town.

ELECTRIC CLOCKS.—The Synchronome Company (Birkenhead) send us a catalogue and price-list of electric clocks on the synchronome system, which is said to be the result of some years of study and experiment. The aim is to dispense with the complicated mechanism of the ordinary clock, and to secure reliability and timekeeping qualities never before attempted.



THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS: ANNUAL MEETING.

THE twenty-second annual meeting of the members of the Incorporated Association of Municipal and County Engineers was held at Halifax on Thursday, Friday, and Saturday, June 27, 28, and 29. The proceedings were opened in the Council Chamber of the Town Hall, Halifax. On Thursday morning, when there were present nearly a hundred members of the Association, including Messrs. R. S. Escott, of Halifax, the President elect; W. Weaver, Kensington; C. H. Lowe, Hampstead; C. Jones, Ealing; J. Patten Barber, Islington; Savage, East Ham; N. Parr, Brentford; R. Godfrey, King's Norton; J. T. Eayes, West Bromwich; F. S. Button, Burnley; Clarkson, Tamworth; J. Cartwright, Bury; H. Percy Boulnois, Liverpool; J. Lobley, Hanley; W. H. White, Oxford; A. Creer, York; J. H. Cox, Bradford; A. T. Davis, Shrewsbury; E. P. Hooley, Nottingham; E. G. Mawbey, Leicester; C. F. Wike, Sheffield; S. S. Platt, Rochdale; T. W. Stainthorpe, Eton; R. F. Vallance, Mansfield; T. Cole, Westminster, Secretary, and others.

The members were received by the Mayor (Alderman M. Booth), who offered them a very hearty welcome to the town, and said that his pleasure in receiving the members was enhanced by the fact that Mr. Escott, the Borough Engineer of Halifax, was to be President of the Association this year.

Mr. C. H. Lowe, Vice-President, of Hampstead, who presided in the unavoidable absence of Mr. A. M. Fowler, the retiring President, who was engaged at a Local Government Board inquiry at Bighouse, returned thanks to the Mayor for the welcome accorded by him to the Association. He also expressed regret at the absence of the retiring President.

Mr. T. Cole, Secretary, then read the annual report, which congratulated the members on the fact that the Association continues to make satisfactory progress, not only in the increase of members, but in the increase of usefulness. During the financial year ending April 30th, seventy-three new members had been enrolled, including fifty-six ordinary members and seventeen graduates. Seven members had resigned, fourteen names had been written off, and the deaths of several members were deeply regretted. The roll now stood as follows:—9 honorary members, 570 ordinary, and 67 graduates, making the total number 646—an increase of 47 on the preceding year. There was a balance in hand on April 30 of 235*l.* 14*s.* 4*d.*, and the position of the Association continued satisfactory. Since the last report two examinations had been carried out—the first at Birmingham, when eighteen candidates were examined, and thirteen satisfied the examiners and received their certification; and the second at the Institution of Civil Engineers, Westminster, when nineteen entered, of whom thirteen satisfied the examiners. Mr. E. R. S. Escott had been elected President, and Messrs. A. R. Binnie, London County Council; C. H. Lowe, Hampstead; and O. C. Robson, Willesden, Vice-Presidents.

Mr. Lowe, Hampstead, in moving the adoption of the report, said that the Council thought that the members must be satisfied with the position of the Association. The members had increased and the funds were in a satisfactory position. The Association had now come of age, and there was no doubt it had done good work in the past and would do good work in the future.

Mr. Savage, East Ham, seconded, and the report was adopted; and a vote of thanks was also accorded to the retiring Council for their services to the Association.

Mr. C. H. Lowe, in vacating the chair for the incoming President, expressed the hope that he would have a successful year of office.

Mr. C. Jones, Ealing, then proposed a vote of thanks to Mr. A. M. Fowler for the zeal and ability which he had shown during his year of office. He remarked that Mr. Fowler was one of the first members of the Association.

Mr. C. H. Lowe (Hampstead), who seconded, said that members who had attended the meetings could not but be impressed with the amount of vigour and energy which Mr. Fowler had thrown into the proceedings.

The vote of thanks was accorded with acclamation.

The President (Mr. Escott) then delivered his presidential address. At the outset he thanked the members for the honour which they had conferred upon him. While he felt the greatness of the honour, he felt still more deeply the

greatness of the responsibility. Perhaps no subject of late years had called forth more attention and consideration than sewage disposal, and engineers representing inland towns had found it extremely difficult to produce an effluent suitable to be discharged into any pure water river or stream. Throughout the length and breadth of the country they heard of Rivers Conservancy Boards being established, with powers granted by Parliament equal to, if not surpassing, the provisions contained in the Public Health Act, 1875. They gathered also from the proceedings that had already been taken that Local Authorities would no longer be allowed to discharge the raw sewage of their districts into any stream flowing through the same. The present Act of Parliament had for years given Corporations and Local Boards all the powers necessary to deal with this important subject, yet the progress made in our manufacturing towns to obtain the desired effect had not met with the success which many of them had looked for. It, therefore, still remained for the Municipal Engineers to persevere in this difficult yet interesting branch of the profession, and not for a moment to think of giving in until the streams of every valley were flowing with clear, bright, and pure water from source to ocean. How was this to be accomplished? It was thought by many that every available piece of land should be purchased for land filtration, and where land could be obtained at a reasonable price per acre it might be advisable to secure it, yet this, in his opinion, was only a minor point for consideration. No doubt, they all agreed that clear and bright effluent could be produced by land filtration where they had a sufficient area, yet he contended that the bright, clear, and pure effluent could be produced by chemical treatment, and by precipitation tanks, of such a standard of purity as to justify its discharge into every river or stream in the country. The extent of land required must be determined by circumstances; one acre per thousand of the population, or even half an acre for that number, must, in many cases, be quite out of the question, for it was quite evident that in the very near future, with science and chemistry combined, the land required would be reduced to a small area, and that a town with 100,000 population would not require one-twentieth part of an acre per thousand for the treatment and disposal of its sewage. It was with regret that he was unable to place before the meeting any definite standard of purity for sewage effluents. They were left very much to their own resources upon this difficult subject. A pure effluent must be produced, yet the analysis of such effluent that would give satisfaction to the Rivers Conservancy Board was at present unknown to them. Combined drainage was another subject of importance that had received considerable attention of late. It was to be hoped that the law relating to this matter would be altered, for all must have noted with regret the poor progress made with the Amending Bill in the present Session of Parliament. The Bill had been systematically blocked upon every occasion, so that no further attempt had been made to carry the Bill through Parliament. With respect to hospitals, Municipal engineers were often called upon at very short notice to prepare plans, and to erect fever and small-pox hospitals. Where the costs of such buildings were defrayed out of the rates, there was not much difficulty to contend with and no time was lost in executing the works. But when the intended erection comprised a permanent administrative block for the medical officer, officials and staff, nurses' wards, &c., and an application was made to the Local Government Board for sanction to borrow money for the erection of such buildings, the question became one of considerable importance. The cost of the new hospital did not appear to enter into the consideration of the head department, and when waited upon with some modest design of an inexpensive character in every way suited to meet the pressing requirements of the epidemic, they were most politely handed a carefully drawn up report upon the provision of isolation hospital accommodation for Local Sanitary Authorities, accompanied by several specimen sheets of plans and sections, showing administrative block and wards, drawn to suit the requirements of nearly every district, with the intimation that plans drawn to correspond with these specimens were the only plans the Department would consider or accept. They were, therefore, obliged to return home and with all speed produce another set of drawings before any sanction would be granted to borrow the amount of money required. This delay might lead to very serious consequences where an

epidemic was at the time raging, and to avoid any unnecessary delay he would suggest to the members about to erect fever or smallpox hospitals to approach the Local Government Board in the first instance. They were ever ready and willing at all times to give full information respecting the requirements of the Board about the accommodation to be provided for an isolation hospital. The plans he had exhibited practically complied with the requirements of the Local Government Board for a smallpox hospital for a town with a population of about 100,000. The building had not been erected, but a site of 65 acres had been secured about two miles from the Town Hall, upon high ground. Every provision was made for proceeding with the works as soon as the Health Department of the Corporation considered that the time had arrived for the erection of the same. The approximate cost of the buildings as designed was 12,000*l.*, exclusive of land. In the present day it was absolutely necessary that every Authority should be fully alive to the importance of providing fever and smallpox hospitals arranged upon the latest and most modern principles that the Local Government Board require. The work of the Municipal Engineer was ever on the increase, and his education only ended with his life. At times they all had exceedingly anxious and difficult duties to perform—difficult because they required deep thought and perseverance in carrying out the works laid upon them, and anxious because it had not at all times been easy to foresee the result so much to be desired. Yet to his younger brethren he would quote a motto in one word which had often helped him in times of difficulty and doubt—viz., action—leaving for the moment the result in other hands, feeling assured that in engineering the faithful toiler would not fail to receive his just reward when his day's work was ended.

Mr. H. Percy Boulnois, Liverpool, proposed a vote of thanks to Mr. Escott for his address. He had been struck all through the address with the remarkable ability with which it had been prepared, the amount of information it gave them, and its literary merit.

Mr. A. T. Davis, Shrewsbury, seconded the vote of thanks, which was accorded with acclamation.

Mr. Savage, of East Ham, and Mr. Lewis, St. George's, Bristol, were appointed auditors; Messrs. Mann, of Sevenoaks, Hawkins, of Bromley, and Silcock, of King's Lynn, were appointed scrutineers; and the various district secretaries were reappointed until the next meeting in their respective districts.

The meeting then adjourned for luncheon.

Messrs. T. S. McCallum and W. Naylor read a joint paper on the Royton Sewage Works. Mr. McCallum read the first portion of the paper, which stated that the urban sanitary district of Royton contains 2,112 acres of land and a population of about 14,000. The question of purifying the sewage was taken in hand by the late Local Board, who selected a site at a point on the outskirts of the district where the two principal valleys meet, the built portion of Royton being situated along the two valleys and on the ridge between them. A plot of land about 15½ acres in extent was purchased for sewage purposes for £8,445. The works constructed upon the site include a refuse destructor as well as sewage purification works. The sewage was almost entirely domestic, but probably nearly one-third of the houses had not yet been connected with the town's sewers. The dry weather flow of sewage was at present about 180,000 gallons per day. The sewage was delivered at the works from two main outlet sewers, and was received in a small detritus chamber containing a strainer with cleansing-rakes attached. After passing the strainer the sewage actuated a 6-ft. diameter water-wheel, which supplied power for working one of Kirby's precipitant mixers and distributors. The precipitant used was ferrocene, and was supplied by the International Company in the lump form. The ferrocene having been added, the sewage passed along a zigzag channel on its way to the settling-tanks. The tanks were six in number, their dimensions being 106½ ft. by 22 ft., and averaging in depth when full about 6½ ft.; their combined capacity was about 500,000 gallons. They were at present worked on the intermittent system, but could be worked on the continuous flow system if necessary. The tanks could deal with over one million gallons of sewage per twenty-four hours. The tank effluent passed from the tanks to a channel formed along the ends of the filter-beds; the latter were eight in number, and had a combined area of 800 square yards. The special medium employed in the filters for

completing the purifying process was polarite, which was protected by a layer of sand as a strainer for arresting any light flocculent matter which might pass over from the settling-tanks. The filters were made up of the following layers:—Sand 10 in. thick, polarite and sand mixed in about equal proportions 12 in., pea gravel 2 in., bean gravel 2 in., walnut gravel 3 in., boulders, with drain tiles between, 6 in. Each filter had a separate outlet valve for controlling the rate of outflow of the filtered effluent, as also for use in connexion with the upward washing arrangement which was provided. The filters when in use worked at the rate of about 1,000 gallons per square yard per 24 hours, but no filter worked for 24 consecutive hours; experiments had proved that the filters could work at the rate of over 6,000 gallons per square yard per 24 hours. There was sufficient area for the filtered effluent to be further treated upon land (by gravitation), but this had not been found necessary and was not done. The sludge from the settling-tanks was swept by squeegees into a main sludge pipe. This pipe was emptied at the close of each day, and the sludge flowed into a sludge tank under the sludge pressing building. The ground floor of the building contained the destructor furnaces, cremator boiler, and sludge cake store. The water pressed from the sludge was pumped back to the settling-tanks for retreatment. There were four destructor furnaces, and space for two additional ones. The furnaces had sloping rocking bars and were provided with steam jets, but it was not found necessary to use the latter. A flue cremator was provided which could work either with oil or coke. The waste heat from the destructor heated a tubular boiler for generating steam, which was used for driving the air compressor for sludge pressing. The following are the figures of a month's working:—

April 25 to May 23 inclusive:—	
Sewage, &c., treated	6,860,000 gals.
Ferrozene used	6,610 lbs.
Sludge cake produced	513 tons
Lime used for pressing	5,936 lbs.
Asphalt refuse dealt with by three furnaces	319 tons.
WORKING EXPENSES. £ s. d.	
Sewage purification (labour)	10 15 0
Ferrozene	7 6 9
Sludge pressing (labour)	6 1 9
Lime	2 13 0
Destructor (labour)	13 5 0
General labour	4 12 4

£44 14 7
The destructor and sludge-pressing plant were supplied by Messrs. Goddard, Massey, & Warner. The total cost of the sewage works (including the destructor and machinery, but exclusive of land), was about 12,000l.

Mr. Naylor's portion of the paper stated that the trials at the works were made with the help of Mr. McCallum on Friday, May 24, for machinery and refuse destructors, and Tuesday, the 25th, for raw sewage and effluent only. The raw sewage was sampled every quarter of an hour, from 10 a.m. until 2 p.m. The quantity of sewage treated was 42,250 gallons, to which was added 53 lbs. of precipitant (ferrozene), or 8.8 grains per gallon. This was allowed to settle until 6 p.m. The filters were then put into operation, and were running from 6 o'clock to 6.50, samples being drawn every ten minutes. At 6.50 the head of water on the filter had fallen 6.5 in., which was equivalent to 880.8 gallons per square yard per twenty-four hours. The results of this treatment showed that the percentage of reduction brought was—total solids, 16.2 per cent.; albuminoid ammonia, 81.5 per cent.; oxygen absorbed, 87.8 per cent. The actual amount of sludge produced was not calculated, as it varied according to the quantity of precipitant used and the length of time it had been standing. It contained, however, 49.23 per cent. of water, 21.66 per cent. of organic matter, including fixed ammonia. The trial of boilers and destructors extended over 54 hours. The amount of refuse burned amounted to 9,996 lbs., or 4.46 tons. The ash and clinker weighed out from this was 4,638 lbs., or 46 per cent. of the input. The water evaporated was equal to 40 lbs. of water per lb. of refuse. This was evaporated straight from the filter-beds at a temperature of 53 deg. Fahr. This result appeared very low, especially side by side with trials of refuse destructors which had been recently published claiming evaporation of about 2 lbs. of water per lb. of refuse, and it was really this very low result at a preliminary trial which prompted this more careful trial and investigation. The analysis of the refuse as sampled from 102 times

weighed out was—Moisture dried at 212 deg. Fahr., 25.3 per cent.; volatile matter, 28.2; ash, 46.5. A sample of the refuse dried contained combustible carbon 11.2 per cent., combustible hydrogen 12 per cent. The calorific value of the refuse dried was about one-seventh that of good steam coal; 1 lb. of refuse produced 46 lb. ash and clinker. This clinker was allowed to lie, however, in the ashpits until it reached a temperature of only 500 deg. F., and was then wheeled out. The heat given off, therefore, in falling to this temperature would enter the furnaces with the draught. The steam generated was used for sludge pressing. The amount of dry sludge turned out by each press averaged 2,025 lbs. at each pressing. It would be manifestly unfair, owing to leakage, to refer to the indicated horse-power per hour per ton of wet sludge pressed. The indicated horse-power possible had the presses been working continuously was 3.4 horse-power per hour per cell. To do this work the steam consumed per minute was 5.48 lbs., containing 6,295 units of heat; the difference between the two, viz. 6,004, being lost by radiation or carried away by the exhaust. If the results showed anything at all, they show that the idea of burning town refuse at any sort of profit was erroneous. It could not be imagined that refuse which gave on evaporation anything less than 2 or 3 lbs. of water per lb. of refuse would pay for carting. If any economies were to be effected in the future in the utilisation of towns' refuse, the points to which attention might be profitably concentrated were (1) reduction of loss of heat owing to evaporation of moisture contained in the refuse, and (2) reduction of loss incurred by the heating of excess air.

Mr. Boulnois (Liverpool) said he noticed that the furnaces were provided with steam jets, but it had not been found necessary to use them. He also noticed that there was no less than 46 per cent. of clinker from the refuse, a very large percentage, no doubt owing to the very low combustion. The question was whether the use of the steam-blast would not add to the combustion, and reduce the clinker. The cost of labour, which was put at 10d. the ton, was also rather high. He thought labour should not cost more than 8d. per ton. The thermal value of the refuse at Royal amounted only to 3.4 h.-p. per hour per cell. At Liverpool it amounted to 6 h.-p. per hour per cell. No doubt if the boilers were placed over the cells they would get a greater calorific value out of the refuse consumed.

Mr. Cox (Bradford) said he had visited the Royton works, and considered them exceedingly well arranged. He, however, regarded the working expenses as rather high. He thought it a serious mistake that the steam-jets were not used, as, with a temperature of 356 deg. Fahr., he did not believe there was proper combustion. At Bradford they had increased the temperature up to 1,800 deg. or 2,000 deg., and, as a result, had increased the power obtained from 6 up to 16 h.-p., and even now they were not utilising all the heat. The heat as it left the chimney was still 1,200 deg.

Mr. Mawbey (Leicester) said, with regard to the water evaporated and the horse-power per cell, uniformity of data was required. At Leicester he carried out some experiments, and found they evaporated one-fifth of a pound of water per pound of refuse. Their refuse gave a residue of 25 per cent. of clinker. An important point was the character of the refuse to be dealt with, and all sorts of conditions had to be considered in estimating the results in different towns. Speaking of Mr. McCallum's paper, Mr. Mawbey said he had carried out some experiments with polarite filters at Leicester, and obtained excellent results. He found, however, that they must keep out lime, as the carbonate of lime filled up the polarite, and rendered it useless.

Mr. W. Spinks (Leeds) said that Halifax was famous for experiments with destructors—experiments of which they heard very little just now. He and his friend, Mr. Jones, attended a series of meetings at Westminster last autumn, at which one of the speakers assured them most solemnly that he evaporated rather over 5 lbs. of water per lb. of refuse burnt. He worked this out, and found it came to about 11 lbs., deducting the clinker and moisture, which was rather better than the best Welsh coal. Possibly, being in Halifax, they might hear something more about it. He agreed with the other speakers that the amount of clinker was excessively high, but they could not compare the results of a Lancashire town with midden refuse combined with ashes with the dry refuse of a town with a water carriage system of sewage,

Mr. Jones (Ealing) said the results referred to by Mr. Spinks were very surprising, and he could not explain them in any way. It was for those who produced them to explain them.

Mr. J. Patten Barber (Islington) said the amount of clinker proved that the refuse consumed could not be ash-bin refuse, as they understood it in the South. He thought experiments conducted over so short a period as 54 hours were apt to be misleading. What they wished to know, was the calorific value of the refuse collected in a town for a period of six or twelve months.

Mr. Silcock (King's Lynn) thought the tank capacity very large for a sewage-flow of 180,000 gallons a day.

Mr. Dearden regarded the burning of house refuse more as a sanitary than a money-making matter. Taking this view, he was of opinion that any temperature less than 1,800 deg. of heat would not render the rubbish innocuous; and the clinker coming from it would not be safe to burn in any place where buildings would be erected. If the heat was not sufficient to destroy the gases and the germs of disease in the rubbish it was valueless.

Mr. Naylor, in reply, explained that the 356 deg. spoken of in the paper was not, by any means, the highest temperature to which the gases were raised. It was only the temperature after a very large proportion of the heat had been transferred to the boiler. Mr. Boulnois, like everybody else, seemed to think there was a high percentage of ash. But the 46 per cent. included the clinker, the fine ash, and the fine ash all weighed in. There were special causes which tended to make the ash higher than at other places. He agreed with Mr. Mawbey that the indicated horse-power per cell depended upon conditions which varied in every town.

Mr. McCallum explained, in reply to Mr. Silcock, that large quantities of storm-water had to be dealt with.

Owing to want of space, we are compelled to hold over the remainder of this report until next week.

SOCIETY OF ENGINEERS.

On Wednesday a visit was paid by the Society of Engineers to the Outer Harbour Extension Works, the Existing Harbour, and the Electricity Supply Company's Station, at Dover.

The outer harbour now under construction at Dover has been designed for commercial purposes, and not as a harbour of refuge. The powers for the construction of the harbour were obtained by the Dover Harbour Board in 1891. The works contemplated under the Act consist of:—

- (a.) An extension of the Admiralty Pier, 580 ft. in length, running approximately in an easterly direction.
- (b.) An eastern arm starting near the Clock Tower; total length, 2,760 ft.
- (c.) The reclamation of about five acres of the sea-bed, between the shore end of the Admiralty Pier and the entrance to the existing inner harbour, with two large steamer jetties projecting therefrom.

The work now under construction, as a first instalment of the complete design, is the East Pier (b), the contract for which is being carried out by Sir John Jackson, Messrs. Coode, Son, & Matthews being the engineers. The first 1,260 ft. of this work will be an iron viaduct in bays of 40 ft., except at three points in its length, where stiffening bays of 20 ft. span, and of greater width, will be added to give lateral rigidity to the work. The main part of the viaduct will have a uniform width of 30 ft., including a footpath 6 ft. wide on each side. The deck is at a level of 19 ft. above high water of spring tides. In consequence of great irregularity in the quality of the chalk bottom, the centre pile of each bay is fixed on a cast-iron cylinder, filled with concrete, after being sunk well into the solid chalk; the outer piles have cast-steel screws 4 ft. in diameter. The superstructure is formed of three rows of lattice girders, properly braced, carrying corrugated decking, on which the road and footpaths will be formed. The gutters, curbs, and nosings are of cast-iron. The direction of the viaduct is approximately south-east. Its outer end will abut on the solid portion of the pier, this latter being 1,500 ft. long. For about 400 ft. from its commencement, the solid work will follow the same south-easterly direction as the viaduct, but thereafter it will gradually curve to the south and south-west. The entrance between the head of the East Pier and the end of the Admiralty Pier extension will be 450 ft. in width, its aspect being slightly to the north of east. The block g

in this solid work will range from 12 to 20 tons in weight. Above low water they will be faced with granite, and will in all cases be founded on the chalk, into which they will be sunk a depth of about 3 ft. The top width of the pier will be 35 ft., and the coping level 10 ft. above high water spring tides, the difference between the level of this portion of the work and that of the viaduct being met by an incline with an easy gradient. On the seaward side there will be a parapet 10 ft. wide, somewhat similar to that on the Admiralty Pier. The pier will be finished by a circular head, 55 ft. in diameter, on which it is proposed to construct a lighthouse. The extension of the Admiralty Pier will be of a similar character of construction to the outer portion of the existing work, but it is proposed to use concrete blocks of greater weight than those in the present structure. As soon as sufficient shelter is obtained from works (a) and (b), it is proposed to commence the reclamation (c) and the two steamer jetties, each 400 ft. long and 100 ft. in width. These jetties will be furnished with landing-stages, and will practically form covered stations into which the trains of the L. C. & D. and the S. E. Railways will run. The bed of the harbour will be dredged so as to give a minimum depth of 15 ft. at low water of ordinary spring tides alongside the jetties and in their vicinity. The sheltered area of the new harbour, when completed, will be fifty-six acres.

The Admiralty Pier affords protection to the western side of the new works. There are two basins—one known as the Wellington basin, of about 3½ acres, with gates of 70 ft. opening, and the other, the Granville basin of 4½ acres, with gates of 65 ft. opening. The present outer harbour of 13½ acres will become an inner tidal harbour at the completion of the extension works. A new lighthouse with a masonry tower surmounted by a lantern of the fourth order is being erected at the turret end of the Admiralty Pier, and the slipway at the upper end of the Wellington basin is capable of hauling up a safe load of 800 tons. The river Dour, from which Dover takes its name, discharges into the harbour upon the upper or north side of the Wellington dock. Mr. A. T. Walsley, M.Inst.C.E., as Engineer to the Dover Harbour Board, has charge of the Admiralty Pier and Inner Harbour.

The entrance to the Dover Electricity Supply Company's station is by a private road leading from Park-street. The building consists of offices, occupying the west portion, and adjoining these are the engine and boiler rooms. The engine-room, which is faced with glazed bricks throughout, is 100 ft. in length by 30 ft. in width; the boiler-room is 100 ft. long by 45 ft. wide. The floor of the engine-room is about 5 ft. above the level of the road. Machinery can thus be readily lifted from waggons by means of a 15-ton crane which traverses the engine-room. The boiler-room is on the road level. The flue extends along one side of the boiler-room, passes under the front of the buildings, and terminates in a circular chimney-shaft, 120 ft. in height. The supply leaves the station at a pressure of 2,000 volts, by Silvertown concentric cables, to some eighteen transformer street boxes in various parts of the town, where the current is converted to a pressure of 100 volts and distributed by means of Prescott paper-insulated mains to consumers' premises. There are at present twenty-one public arc lamps in the streets, each of 2,000 N.C.P., and ten further lamps have been contracted for, to be suspended from arches. The contract for the whole of the machinery has been, and is being, carried out by the Brush Electrical Engineering Company, Limited. The engineer and manager is Mr. A. J. Lawson; and the resident engineer is Mr. A. A. Whitlock.

COMPETITIONS.

BOARD SCHOOL, LANCASTER.—We understand that the Lancaster School Board have placed first the plan sent in by Mr. Robert Walker, architect, of Windermere, under motto, "Up to Date," for a large board school for 1,000 children, to be built in the Marsh, and have instructed him to proceed with the work.

NEW CHAPEL AND SUNDAY SCHOOL, NOTTINGHAM.—In a recent limited competition for New Chapel and Sunday School, for the United Methodist Free Church, Gregory Boulevard, Nottingham, the design of Mr. Fredk. W. Dixon, architect, of Manchester and Oldham, has been selected. There were nine competitors. The chosen design of late Gothic style is to be executed in dark red pressed bricks, with dressings of moulded brick and terra-cotta. The large traceried windows will also be in red terra-cotta.

Illustrations.

FURNESS ABBEY.*

THE Abbey of Furness was originally established in 1124 through the munificence of Stephen, Count of Boulogne, afterwards King of England, at Tulket, near Preston, in Amounderness, and colonised from Savigny. In 1127 the founder added to his first endowment the forest of Furness and other lands adjoining, whereupon the monks removed from Tulket and took up their abode at Furness.

Here grew up the great Abbey whose ruins still exist; an Abbey which quickly grew so rich that, at the time of its suppression, in 1537, when it was surrendered by the abbot, the prior, and twenty-eight other monks, its clear annual value was estimated at over 800*l.*, a sum equivalent to at least 16,000*l.* a year at the present day.

Of the history of the Abbey from its establishment at Furness in 1127 to its destruction in 1537 there is practically nothing that throws light upon the architecture or arrangements. For the elucidation of these we must turn to the remains themselves.

Although Savigny did not become affiliated to Cîteaux until 1148, the disposition of the buildings at Furness is entirely Cistercian. The monks at their first establishment must, therefore, have been content with temporary quarters only, and by the time they were ready to replace these by structures of a more permanent character, they had become Cistercians, and so adopted the plan and arrangements peculiar to the order throughout Europe.

The site of the Abbey somewhat resembles that of Fountains in being a contracted valley, but here this so runs that the buildings, which, at Fountains, are placed east and west of the church and cloister, extend at Furness to the north and south.

Although originally but little inferior in extent to Fountains, the existing remains at Furness are unfortunately fewer, there being not much else now above ground than the central parts and west end of the church, the eastern range of buildings, and some outlying fragments of the infirmary and abbot's lodging.

On turning into the Abbey grounds from the railway station, the first building that meets the eye is the shell of a charming little chapel of the early part of the Geometrical period. It still retains its altar platform, sedilia, and drain. This building is usually misnamed the "abbot's chapel," but it is really the *capella extra portas* usual in all Cistercian abbeys, as may be seen at Croxden, Fountains, Rievaulx, &c. Beside it is a wide arch of entrance into the Abbey precinct. A few yards further south, close beside the Abbey Hotel, the road passes between the excavated remains of the Abbey gatehouse, which was evidently a building of considerable architectural importance. The Abbey Hotel stands on the site of, and probably incorporates, though much altered, one of the guest-houses. The gatehouse opened into the outer or base court of the Abbey, which contained the stables, bakehouse, brewhouse, and other menial buildings, as well as the lodgings for guests, and probably an infirmary for their use. All these have disappeared, but traces of some important buildings may be noticed under the shrubs in the hotel gardens on the east side. A little further on are the ruins of a small gatehouse of the fifteenth century. This stood in a wall which extended from some destroyed buildings to the north porch of the church, and opened into the monks' cemetery, or perhaps into an outer part of it where lay folk were privileged to be buried.

We now come to the Abbey church. It originally consisted of a short aisleless presbytery, a central tower, north and south transepts, each of three bays with eastern chapels, and a nave and aisles of eleven bays.

The original presbytery was almost entirely rebuilt at the beginning of the fifteenth century, and its western part alone remains, though much altered. It retains traces of a large arch on each side that opened into the chapel beyond. The north arch is now blocked, and the south reduced to a doorway. The great arch into the crossing remained intact until a few years ago, when it fell. The stones, which were but little injured,

have been carefully replaced under the direction of Sir James Ramsden. The arch is pointed, with somewhat curious Transitional mouldings, and rests on twin shafts, which are stopped off some little way from the floor on corbels of unusual pattern. The shafts themselves are also set back into the wall so as to be as unobtrusive as possible. The other arches of the crossing have fallen. Those to the north and south rested on shafts starting from the floor. Each transept opened into the chapels east of it by an arcade of three pointed arches resting on clustered columns with square capitals.

The triforium stage contains three round-headed openings, of which the middle one on the north side is fortunately perfect. It is of two orders, the inner of which is sub-divided, and has two trefoiled arches carried by a circular column with square capital; the side-shafts are similar. The tympanum is solid and plain, save for a circular sinking between the heads of the arches. The clerestory windows have all been walled up. They seem to have been plain round-headed openings. The chapels east of the transepts have been almost entirely destroyed. Those on the north side retain the platforms and bases of their altars, and traces of the perpendicular walls that divided them. The west side of each transept has in the lower stage a pointed arch opening into the nave aisle, and two plain round-headed windows, which were subsequently filled with Perpendicular tracery. In the upper stage were formerly three clerestory windows like those opposite, but these were blocked in the fifteenth century, and replaced by two large three-light windows. At the same time large windows with similar tracery were inserted in the transept gables. In the north gable there is below the window a large and elaborate round-headed doorway of three orders with detached jamb shafts. A doorway in this position, the side of the church remote from the cloister, is usual in Cistercian abbeys, but it is seldom of any architectural importance. At Furness, the contracted site probably prevented any prominence being given to the west front, where, indeed, the later tower has no western or other entrance; the door into the transept must therefore have been the principal entrance into the church, which explains its enriched character. It was in later times covered by a porch, with a descending flight of steps from the higher ground on this side. The window in the south gable of the transept is shorter than its fellow opposite, on account of the abutment of the dormer roof below it. The wall below is quite plain, but has on its west side, some feet from the ground, the usual doorway by which the monks came into church at midnight to say their *vigilia* (i.e., matins and lauds). The flight of steps up to the door has been removed. At about the level of the door-sill, in the transept wall, are two brackets which evidently supported a wooden gallery. This must have been reached from the dormer stair, but its purpose is not apparent. It may, however, have held the clock, which usually stood in this part of the church.

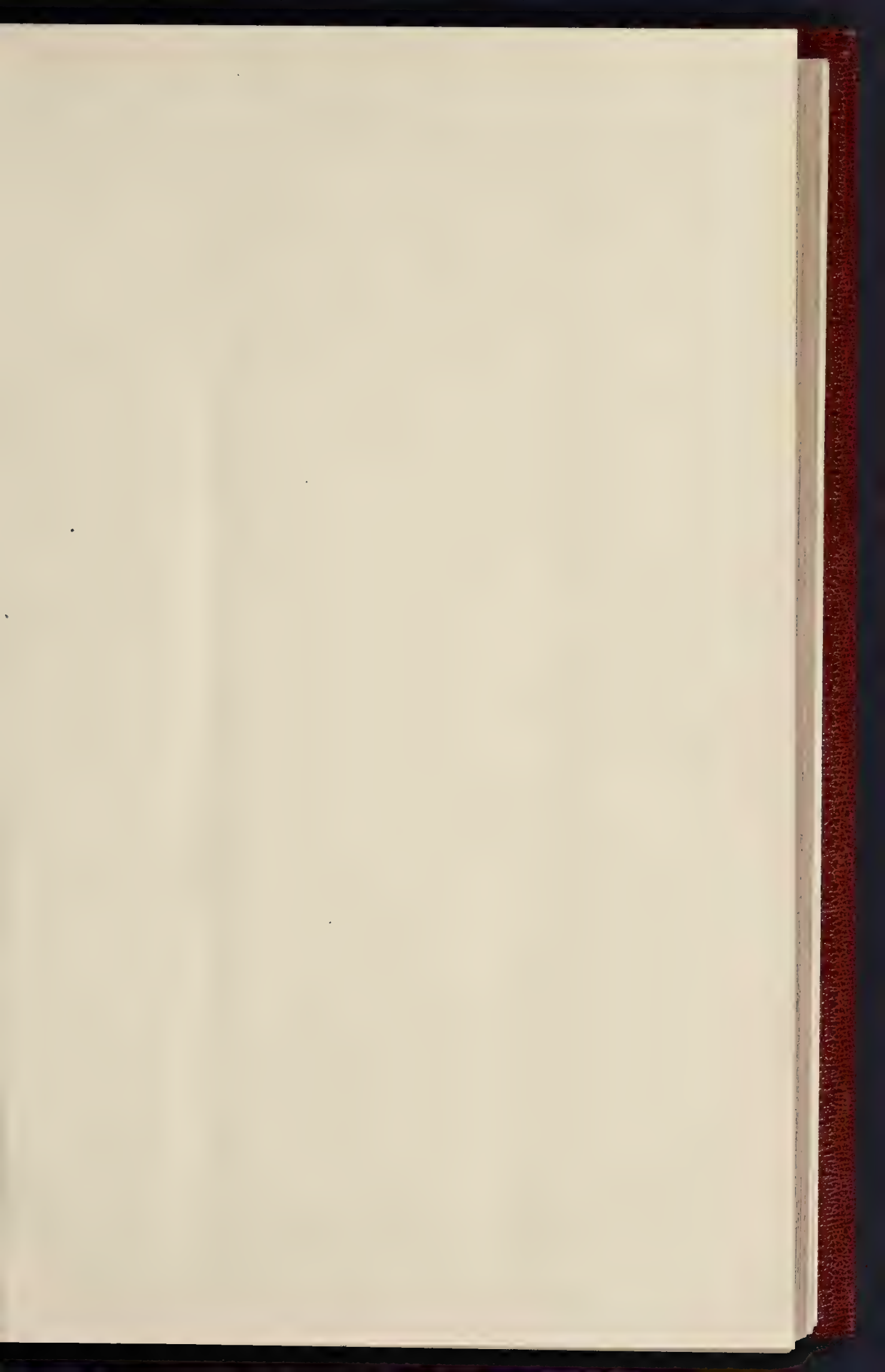
The original presbytery was probably vaulted, as were the transept chapels, but the transepts themselves had wooden ceilings only.

Of the nave little else is left than the stumps of the piers and the greater part of the outer wall of the south aisle. Architecturally, it probably resembled the east side of the transepts, but the piers were alternately round and clustered. The aisles were vaulted. In the south, which is the earlier, as usual, to enable the cloister to be built against it, the vaulting shafts are plain three-quarter cylinders; but in the north aisle the shaft was compounded of a large central and two-side members, all cylindrical.

The whole of the original work of the church is of the Transitional period, with a combination of pointed arches and round-headed doorways and windows, and though many of the columns are clustered, the capitals have always the square abacus, with slight leafwork underneath. The earliest portions, that is, the central parts, cannot be much earlier, if at all, than 1160, which accounts for the Cistercian characteristics so plainly stamped upon the building. The main part of the nave was probably of somewhat later date, but a continuation of the same work.

Early in the fifteenth century the eastern half of the old presbytery, perhaps on account of insufficiency of light, as well as its restricted area, was taken down and replaced by a much lighter work which extended also a bay further east. At the same time the chapel adjoining it on the south was prolonged nearly as far eastwards to form a vestry. The new presbytery had on the east a large window of many lights and as wide as could be, but only the jambs remain. On the north

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of "Furness." The next of the series (Romsey) will appear in the number to be published October 5. Further parts of this and of the three Cathedral series ("England and Wales," "Scotland," and "Ireland") will be found on p. 30; also (on page 1) of the recent re-issue, in book form, of the series of English and Welsh Cathedrals.

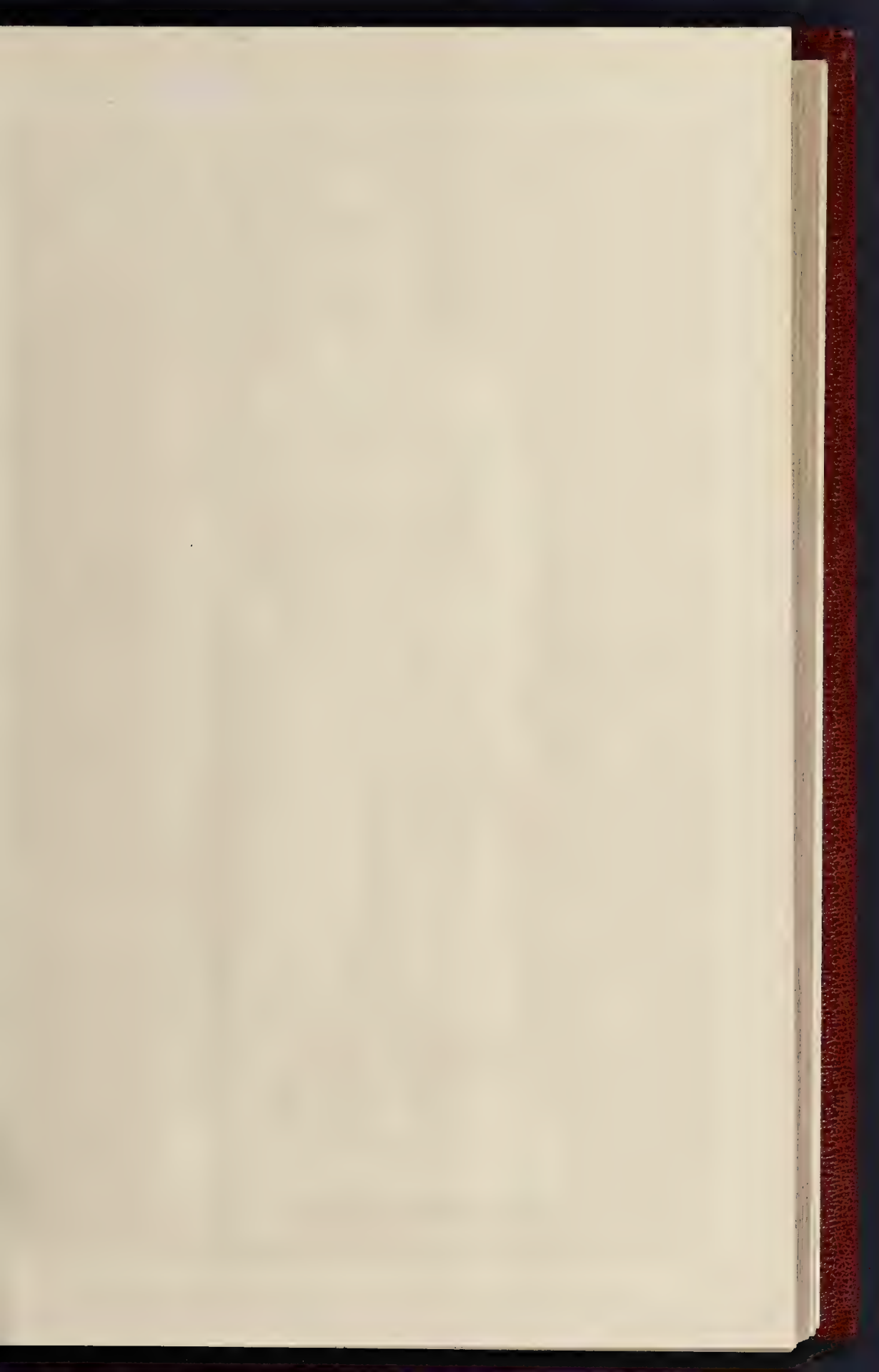




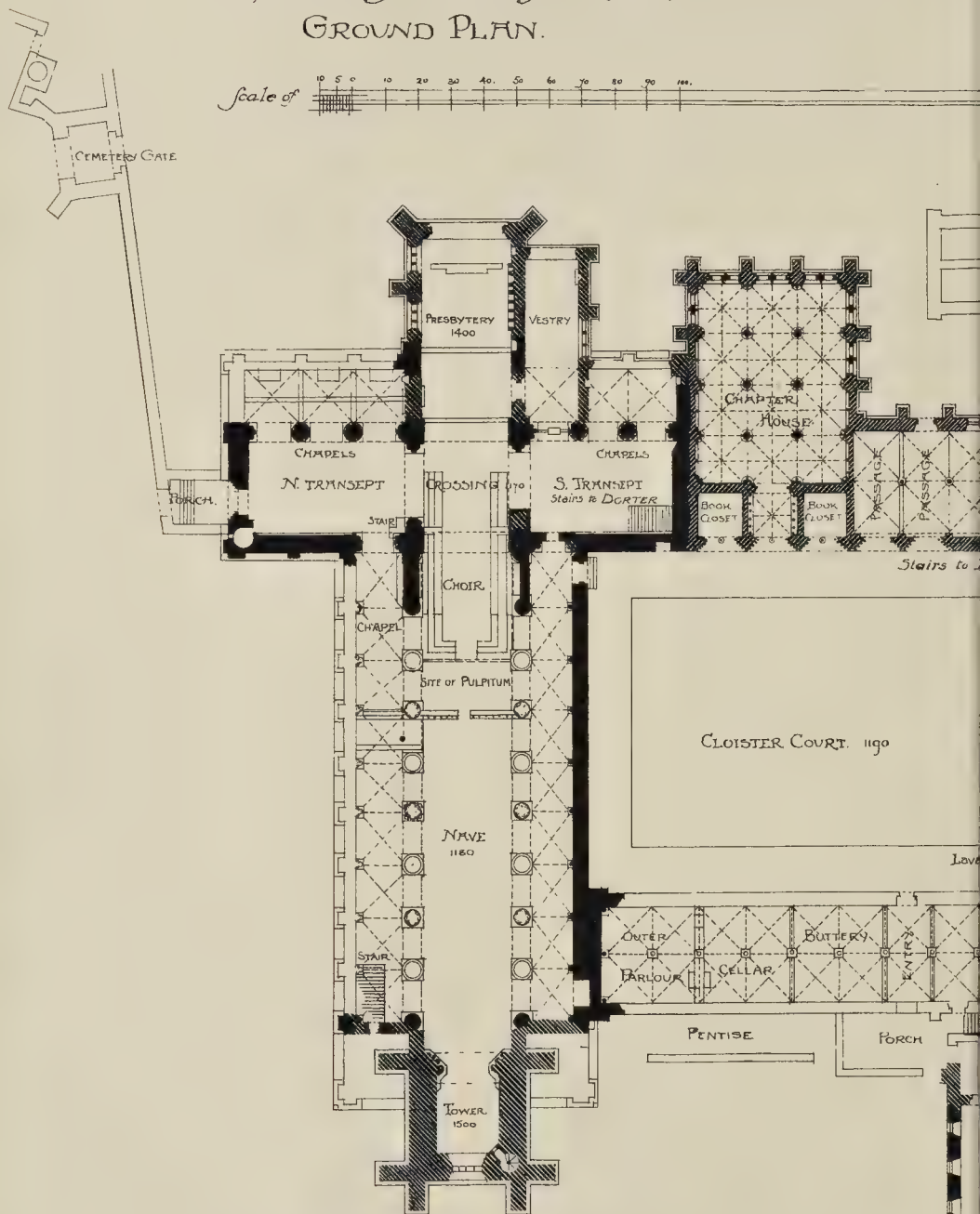
PH. PHOTO. SPRAGUE & CO. 44 & 46 EAST HARTUNG STREET LEXTER LANE E.C.

"LA ROCHEJACQUELIN". PORTRAIT STATUE—M. FALGUIÈRE, SCULPTOR

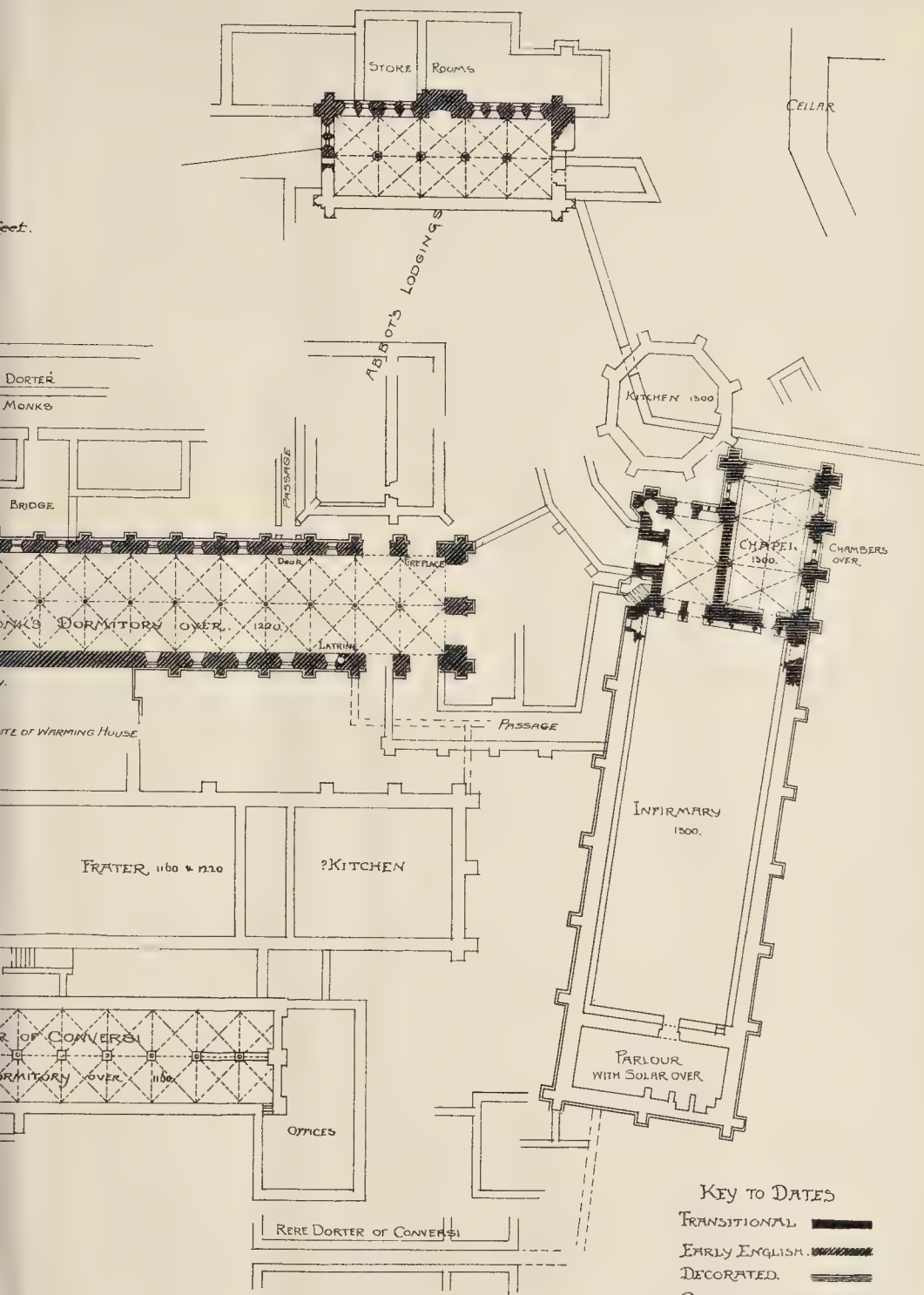
Paris Salon, 1895.

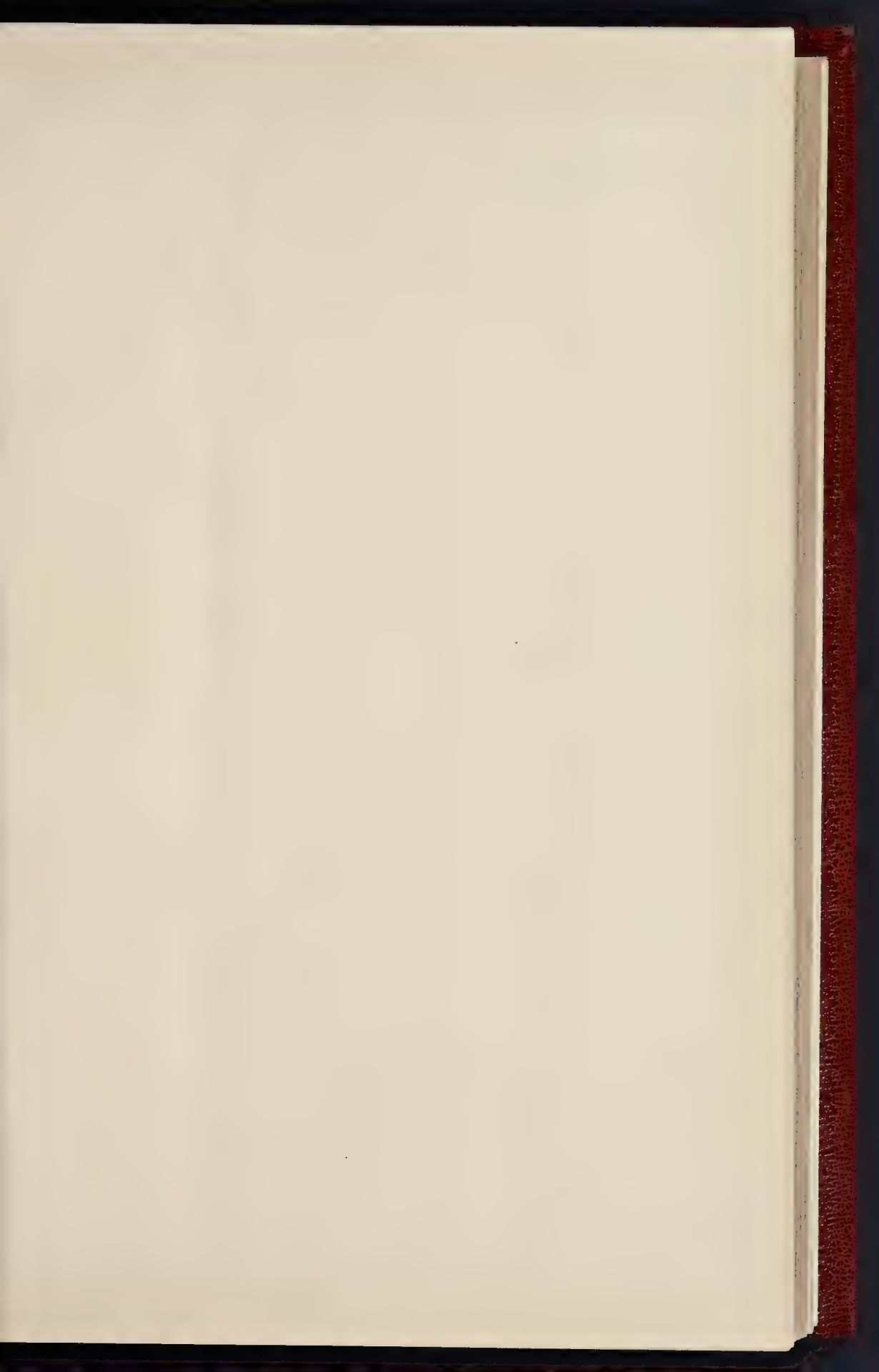


St. Mary's ABBEY FURNESS. GROUND PLAN.



BASED ON SURVEY BY J. HARRISON ESQ.
IN THE ABBEY SQ. SKETCH BOOK.







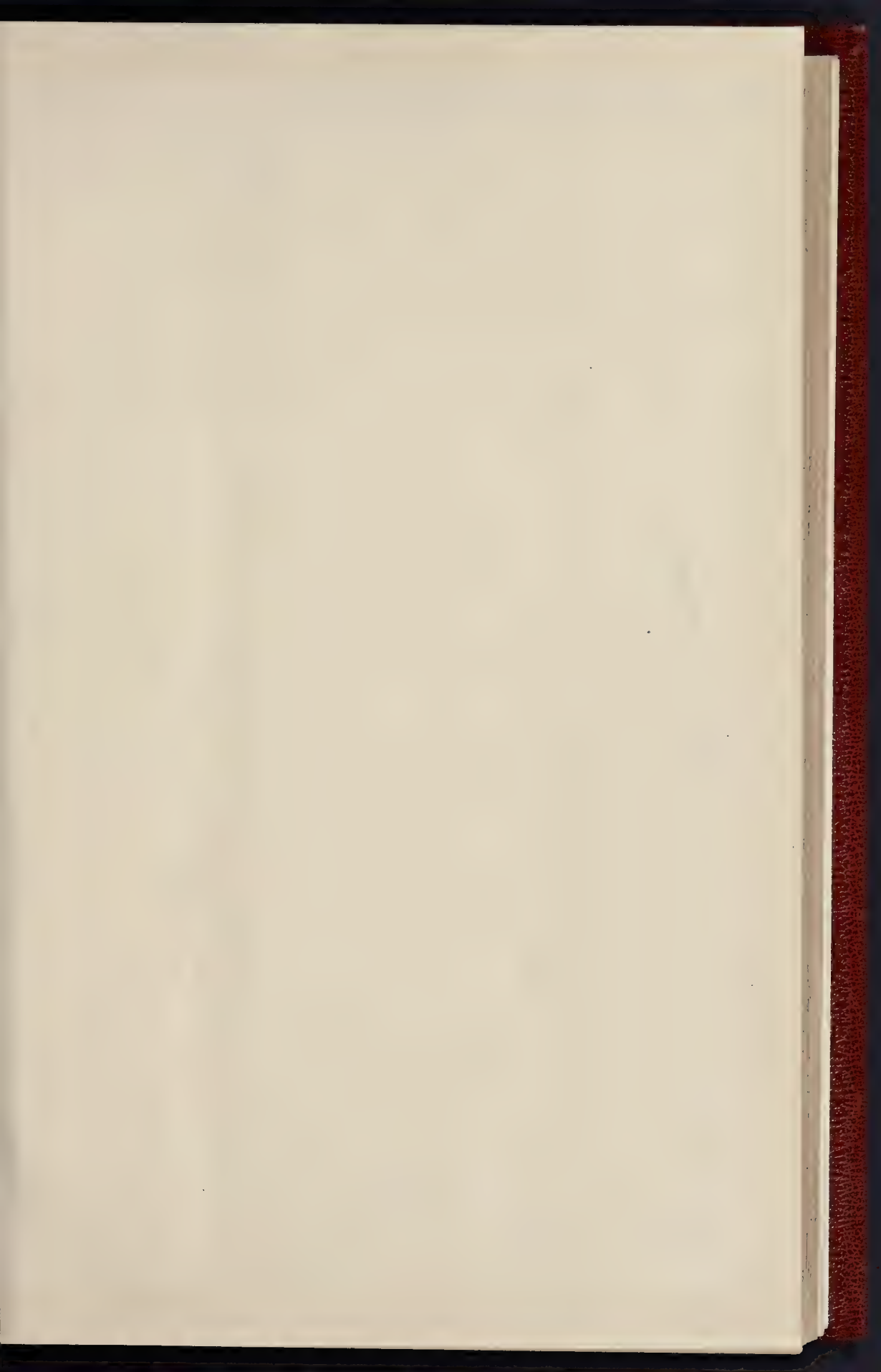
THE ABBEYS OF GREAT BRITAIN.—No. 14. FUR

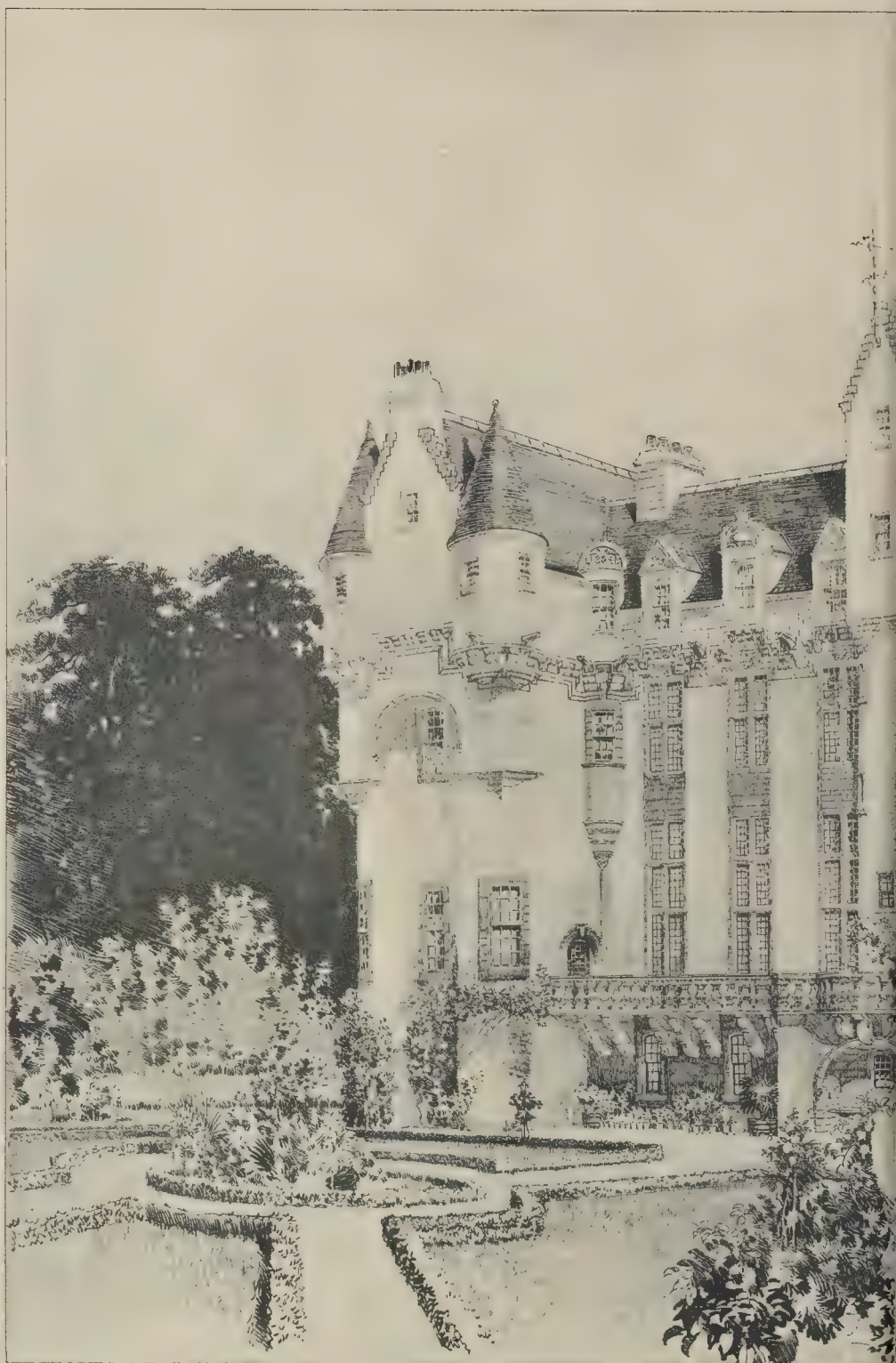
DRAWN BY M



PHOTO L. THO. SPRAGUE & CO. 145 EAST HARDING STREET FETTER LANE, E.C.

FROM THE SOUTH-WEST ANGLE OF CLOISTER.
KERSFORD PITE.





"KINCARDINE," DEESIDE, N.B.—

DRAWN BY M.



NEW PHOTO SPRUCE & CO. 465 EAST HARDY STREET, FETTER LANE, E.C.



PHOTOGRAPHED BY SPRATUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

"MEISSONNIER" PORTRAIT STATUE — M FRÉMIET, SCULPTOR



Furness Abbey: Sketch from North Transept, showing side light of Chancel.

were two tall windows, each probably of four lights with a transom. The tracery has long fallen out, but the pointed openings remain, with ogee hood-moulds ending in large carved finials. On the south were two other windows, but owing to the abutment below them of the vestry roof these are barely half the length of those opposite. The wall below them, on the presbytery side, contains four canopied sedilia,

together with a drain and towel recesses of similar work, the whole forming one fine composition of uncommon richness and beauty. The sedilia are all on one level, and have pierced traceried loops between them. The basin of the drain, probably because it was of marble, has been torn out. Above it is a niche for the cruet. The towel recesses are tall narrow niches, which still retain the stumps of the iron hooks or pegs on which the

towels once hung. The new presbytery was not vaulted, but had a wooden ceiling resting on corbels. In the presbytery are now collected various monumental and other remains from various parts of the church.

The vestry was amply lighted by a large window on the east and two on the south, and, as usual, contained an altar. The drain for this exists. The corbels for the roof remain in the

do so, divest itself of the responsibility of itself building and managing buildings on land so acquired."

Sir John Lubbock seconded the amendment, which was adopted on a division by 46 votes against 45.

Millbank Prison Site.—The paragraph in the report of the Public Health and Housing Committee relating to the employment of an outside architect to prepare plans for artisans' dwellings to be erected on the Millbank Prison site was again considered.*

An amendment had been proposed and seconded at the last meeting to refer the matter back for further consideration.

Colonel Rotton said that at the last meeting Mr. Burns, in advocating the proposed course, had stated that the Council had already engaged an outside architect to prepare the plans for the Bexley Heath Asylum, but he did not seem to realise that the planning of an asylum undoubtedly required the services of a specialist.

Mr. Roberts said that Mr. Blashill was an architect of considerable eminence, and quite capable of preparing suitable plans for the proposed buildings, but in his (the speaker's) opinion Mr. Blashill ought to be their adviser in this matter. After all, it was a question of economy, and they would get a better economical result if they employed a specialist than if the work was carried out by their own architect. He thought, however, that the work ought to be given to an architect selected in open competition, and not, as was proposed, to a specially-selected architect.

Mr. Bruce said that in 1893 the matter was made the subject of an instruction from the Council to the committee on account of the pressure which then prevailed in the Superintending Architect's department. The present recommendation was the direct result of that instruction. The duties of the Superintending Architect in the vast district with which he had to deal were exceedingly onerous, and a system of delegation was urgently required.

Mr. Marks desired to point out the practical financial bearing of the question. If the staff of the Architect's office were increased by the addition of a Designing Architect, at 700*l.* or 1,000*l.* a year, it would be obviously cheaper than paying an outside architect a commission of 10,000*l.* or 12,000*l.* on one job. The effect of the present proposal would be to supersede a very competent official, and if the precedent were adopted it might result in superseding others.

Colonel Ford regarded the recommendation as an attack upon Mr. Blashill, who had told the Committee he was quite prepared to undertake the work.

On a show of hands the amendment was carried by a considerable majority.

Light Railways.—The same Committee recommended—

"That a communication be made to Her Majesty's Government expressing the hope that if the Light Railways Bill is proceeded with and referred to a Select Committee there may be added to that Committee's reference a special instruction to make full inquiry into the questions above referred to, and that the Home Secretary and Mr. Bryce be asked to receive a deputation on the subject."

Alderman Beachcroft moved, as an amendment, "That, as the Light Railways Bill has been dropped, the Government be urged to appoint a Select Committee to inquire into the subject of tramways and light railways, as to the best mode of securing their extension, both in agricultural and urban districts, especially in relation to the needs of the Metropolis and its suburbs."

The amendment was agreed to.
Asylum Accommodation.—The Asylums Committee recommended that the Council do authorise the expenditure of 40,000*l.* for the erection and equipment of temporary buildings at Colney Hatch and Bantstead Asylums, to accommodate 300 female and 300 male patients respectively.

This was agreed to, and the Council subsequently adjourned.

Correspondence.

To the Editor of THE BUILDER.

THE ARCHITECTURAL MUSEUM.

SIR,—I have read with much interest your report of the Annual Meeting of the Royal Architectural Museum and Westminster School of Art in the *Builder* of June 22, and note with pleasure that efforts are being made to provide more adequate accommodation, not only for the students, but also

for the valuable collection which at present is so miserably "cabin'd, cribb'd, confin'd, bound in" at Tufton-street. According to Sir A. W. Blomfield the Museum receives but slight support from members of the profession. Is not the Council, to some extent, responsible for this apparent lack of interest in their Museum? The collection, consisting principally of casts of Mediaeval ornament and detail, a few specimens of wood-carving, and a limited number of Classic examples, would afford material for useful study to many, at least, of the younger members of the profession, and to the Architectural Association, but, if my memory serves me, you are precluded from *sketching* these examples—the only way by which to obtain a sound knowledge of architectural detail—unless you happen to be a student of the Westminster School of Art, or have subscribed that golden coin with which the average student, architectural or otherwise, is not overburdened. Again, and this greatly surprised and disappointed me when first visiting 18, Tufton-street—there is nothing to represent the *practical* side of architecture. Is it unreasonable to expect that an architectural museum will contain specimens, if only of the more costly materials employed in the construction or embellishment of some of our finest buildings? It would certainly be most desirable, did space permit it—to convert a museum like that at Tufton-street into a permanent Building Trades' Exhibition; but surely many of the natural products used in building operations might with advantage be represented—such as, for instance, a collection of British building-stones, carefully labelled, with a concise description of their respective geological positions, chief characteristics, uses, &c., each example having not only a tumbled but also a fractured surface, that the physical structure may be more readily observed.

We are reminded in another column of the issue of the *Builder* already alluded to, of the unpleasant colour of "fresh cut" Pentelic marble. A collection of the more rare and costly marbles used for decorative purposes would not only present an interesting study, but would also afford any local architect the opportunity of obtaining his client's approval of a particular stone he may have specified, thus preventing his patron from unpleasantly reminding him, in days to come, that the marble decorations of his hall are of a "cold, sugary white," or any other equally unsatisfactory hue.

By enlarging the scope of the Museum in the manner I have but very imperfectly indicated, the Council would, I believe, have little cause to complain of want of appreciation, or lack of support, on the part of the architectural profession.

FREDERICK JOHN SAWYER.

Brighton, June 24, 1895.

* * We print our correspondent's suggestions, but we are inclined to think that a museum of materials and a museum of architectural art belong to a distinct order of things; and at all events they could not be combined at Tufton-street without a new and enlarged building. The Architectural Museum was originally an outcome of the enthusiasm of the Gothic revival, which is the reason of the immense preponderance of Gothic detail illustrated on its walls. Its contents need revision for the requirements of the present day.—ED.

COVENTRY MUNICIPAL BUILDINGS COMPETITION.

SIR,—In reference to your article in last week's *Builder*, the question of the plans appearing in my name was a matter of arrangement between Messrs. Brewell & Baily, of Nottingham, Mr. C. E. Malloys, and myself, and you will see by the copies of the two local papers I send you herewith (dated June 21) that I took the earliest opportunity, after the official notification, of publicly announcing the fact that I had received the co-operation of the above-named gentlemen.

H. QUICK.

* * Nevertheless, we think that to set of competition drawings exhibited which bear the name of one architect, when they are obviously the work of another whose style of drawing is well known, is evidence of a very bad system.—ED.

RE MESSRS. BAIRD, THOMPSON, & CO., VENTILATING ENGINEERS.

SIR,—It having come to my knowledge that the above company have recently issued a large number of prospectuses bearing my name as one of the directors, I beg to state that I am not a director, and that I have no connexion whatever with the company, and that the use of my name on their prospectus is entirely unauthorised.

WALTER ROWLEY, M.Inst.C.E.

Leeds, July 2, 1895.

STAMPED STEEL.

SIR,—We shall be much obliged if you or any of your readers could kindly tell us whether stamped steel has been used for ceilings in this country, and if so, where it can be obtained from, and whether any of your readers have had any experience with regard to the merits of the material.—Yours faithfully,

ROBERT CROOKS & CO.

The Student's Column.

METALS USED IN BUILDING.—I. INTRODUCTION.

THE term "metals," as here employed, includes only the "metals of commerce," as used by the architect. Some of these are not metals in the strictly scientific sense, and the vast majority are alloys.

The *raison d'être* of this series of articles is to describe the various ores which yield the metals in the first place, and their mode of occurrence in Nature. Then numerous alloys made from these metals and other mixtures will be defined, and where possible, the proportions which go to make them up given, especial stress, naturally, being laid on those most largely used in building, no matter how unimportant they may be from a general standpoint. From this it will be gathered that the metallurgical aspect of the subject will be treated in some detail. Many of the so-called "new metals" will be classified in their proper place, and although we have no intention to go into the merits of this or that man's invention, it will not be difficult to learn from what we shall say as to how far such inventions merit the new terms applied to them, and as to how far, on the contrary, they may be referred to metals previously known. The fact is that there is no end to the possible number of alloys; there are so many metals, and such a large number of them may be mixed together, and in such variable proportions, that the changes may be rung almost in infinity. We make no pretence, therefore, of dealing with all such alloys, even where they may be said to be indirectly connected with building, and if we were able to deal with all of them, it is very questionable whether any useful purpose would be served. For the difference between one of these alloys and another is frequently only so much as may be tolerated in the eyes of the law as not to lead to the infringement of patent rights. Such new metals, of the "subtle difference" order, will be grouped together and dealt with accordingly. We make this reservation, however; that when any slight difference in composition leads to an important alteration in the applicability of the metal, that will be distinctly described in proportion to its significance in the building arts. True metals, therefore, will be given separately; whilst their alloys will be defined either specifically or generically, according to their importance to us.

Bearing in mind the difficulty experienced in uniting certain metals in the "cold" state, we have deemed it advisable to say something concerning soldering, especially in reference to the aluminium group.

The uses to which the more common of these metals and alloys are put, their relative ductility, malleability, flexibility, elasticity, brittleness, hardness, specific gravity, and (in some instances) structure will all be explained. Where it would appear to be of any value, the strength of the materials will be given, as also their behaviour under varying temperatures, including expansion, contraction, and "fatigue." Great attention will be paid to durability of both metals and alloys in the strict sense; this part of our work deals with chemistry and physics, and by the term "durability" we mean durability in all its aspects—as affected by the action of the weather, both indoors and out, abrasion and other forms of friction, intermittent application of pressure, and the like. Intimately associated with this is the subject of tarnishing bright metals. Other points to which we shall attract the student's attention in connexion with the uses of metals, will have reference to the composition of certain wall-papers, gilding, and internal decoration generally.

To some extent the subject of casting and moulding will be gone into, especially in regard to the casting of bronze. It will be useful to give some idea of the various qualities of metals of the lead group from the point of view of their suitability for making pipes; including the strength of these latter, apart from the strength of the alloys of which they are made. In certain cases the long association of one metal with another leads to the deterioration of both, and it sometimes happens that the durability of a metal is very largely influenced by a more or less earthy substance, in which it may be embedded or driven into, whereby unsightly stains are produced and general decomposition sets in. It is impossible, therefore, to dissociate the metals of commerce from non-metals, but we do not intend to deal with these latter on the present occasion more than can possibly be helped.

The subject will not be altogether limited to materials used in England; there are many alloys

* See last week's *Builder*, p. 407.

useful for our purpose made on the Continent and in America which we shall consider. Some of these could be produced here from ores found in England or the colonies, whilst others are only to be made in the vicinity of the actual spots where one of the constituents is found.

One of the most important objects of this series is to explain to the student what the various metals used in building really are; when iron is disguised and then called "zinc," or a composition of metals is known as "lead," or a carefully-concocted mixture goes by the name of "copper," it is as well that these and kindred facts should be appreciated and the materials compared with the specification accordingly. It is becoming increasingly difficult to recognise the real from the spurious designation of such metals under ordinary circumstances, as the inferior articles are so often lent the powerful aid of the electro-bath and thus venerated. This more particularly applies to small goods.

Finally, our remarks on iron must be brief, as metals of that group have already been fully described in our columns.*

The Principal Ores.

The origin of the vast majority of ores is quite unknown. Several are simple substances that the chemist has never been able to split up, and these are known as elements. Ores, however, are most frequently of a compound character, as we shall presently see.

Iron.—Pure metallic iron is extremely rare in nature; it occurs in bodies that have fallen upon the earth from extra-terrestrial space—meteorites—also in certain basic igneous rocks. Pure iron can easily be procured in the laboratory by heating the oxide in a current of hydrogen gas, and by other methods. Iron chiefly occurs as oxides, carbonates, and sulphides, and is one of the commonest minerals in nature.

The four principal oxides are hematite, limonite, magnetite, and titanite iron. Hematite is found as "specular iron," having a splendid metallic lustre, but most commonly it is fibrous, whilst it sometimes occurs as amorphous aggregations. Limonite, unlike the preceding form of iron, never occurs in a definite crystallised manner, but is fibrous (when it is sometimes difficult to distinguish from hematite), or indistinctly crystalline; it may also be in rounded knobs, or as thin crusts on other minerals, or stalactitic, earthy or amorphous. The limonite of commerce is mostly of a brown tint, and occurs in the earthy or hard fibrous forms. Magnetite is abundant in octohedral crystals, also in minute irregular grains and as a massive rock. As the name implies, it is strongly magnetic. It is black, with a semi-metallic lustre and subconchoidal fracture. Titanite iron, titaniferous iron, or ilmenite, as it is variously termed, may be distinguished from magnetite, amongst other things by its rhombohedral crystals. It occurs frequently in thin plates or tables, as well as in diffused grains. It possesses a brown, semi-metallic lustre in reflected light. In its massive form, in Canada, it occurs as much as goft. in thickness. Being a mixture of the oxides of iron and titanium, it is not always regarded as an iron ore.

The principal carbonates are chalybite, or porthose iron ore and clay iron-stone.

The sulphides comprise pyrites, which are yellow with a brassy lustre occurring in all rocks. Then we have the sulphate, copperas, and the arseniate, mispickel, found sparingly except in few localities.

OBITUARY.

MR. THOMAS CHATFIELD CLARKE.—On the 8th ult. the death of Mr. Thomas Chatfield Clarke, F.R.I.B.A., F.S.I., took place at his house in Vestbourne-terrace, Hyde Park. Mr. Clarke was born at Newport, I.W., in 1829, and established himself in London as an architect and surveyor in 1855. He soon took an influential position in his profession, and became surveyor to the Fishmongers' and Cordwainers' Companies, to the trustees of Dr. Williams's Library, and to other public institutions. He was well known as an expert in cases of compensation, and those having to do with light and air. He was the architect of the Bishopsgate School for Girls, the Royal Bank of Ireland in Bishopsgate-street, the new offices of the Midland in Bouvierie-street, the new school of the Mercers' Company in Barnard's Inn, and of various buildings in other parts of London. Mr. Chatfield Clarke sat for Finsbury on the first and second School Boards for London. As a Liberal he contested Poole in 1884, Hammersmith in 1885, and Grantham in 1892, but did not succeed in entering Parliament. He was a Fellow of the Royal

Institute of British Architects from 1852; and last year was President of the Surveyors' Institution. He was a magistrate for the County of Hants and for his native town of Newport. He married in 1859 a daughter of the late Mr. J. S. Nettlefold, who, with six sons, survives him.

GENERAL BUILDING NEWS.

CHANCEL, HOLY CROSS CHURCH, CANTERBURY.—The chancel of this church has recently been re-opened by the Bishop of Dover, after careful restoration. The church is an interesting specimen of Early Perpendicular work, having been erected towards the close of the fourteenth century, in place of a previous church which, like several other churches of early date, had been erected over the west gate of Canterbury. At the period named, the gate was demolished to make way for the well-known gateway which was then erected in its place, and the church was reconstructed on a new site close to it on the south. The chancel has a good paneled roof of oak, which has been repaired, several of the broken boards being renewed, the ribs re-painted, and the bosses re-coloured and gilt, while the boarding has been cleaned. Two traceried windows, with segmental heads, give light on the north and south sides, two on each side, but the original windows having been worked in friable Kentish rag-stone, had crumbled to decay, and had been renewed on the exterior in Roman cement. These have been entirely reworked in Bath stone, sufficient portions of the old work being retained to show that the new corresponds with the original work. On removing the cement coating it was found that there had originally been labels to all the windows. These have been restored. The eastern window is a memorial to the old Huguenot families who found a shelter in the parish from the persecutions in France. It was erected some time since by the Huguenot Society. The reredos, erected about twenty-five years ago, has been decorated and relieved by gilding. A floor of majolica tiles has succeeded the rough paving-tiles laid down when the reredos was erected, and an elaborate corona has taken the place of some poor gas-fittings. The works have been carried out by Mr. H. B. Wilson, builder, of Canterbury, from the designs of Mr. Loftus Brock, architect, of London. The entire cost has been defrayed by Mrs. Molony, the Lay Improver.

CONSTITUTIONAL CLUB, LINCOLN.—The foundation-stone of the new Constitutional Club, Lincoln, has just been laid. The building is arranged on the outer or street lines of the site, and has frontages over 200 ft. in length. The club has two main entrances, one in Broad-gate and the other in Silver-street. Both entrances lead into a central hall, which, owing to the peculiarity of the site, is circular on the plan, and from it ascends a stone staircase to the first floor of the building. The Silver-street wing, which is built close up to the street, contains, on the ground floor on the street side, a small office for a clerk, a scullery, pantry, and lavatories. Facing the garden are a committee-room, a kitchen, and a ladies' room. In the Broad-gate wing, south of the principal staircase, and approached therefrom, is the bar, facing the garden, a card-room opposite to it; and the whole width of the wing is a smoking-room, with the addition at one end of a raised dais. The corner of the building between Silver-street and Broad-gate contains an irregular-shaped assembly-room, having a long frontage of over 50 ft. The first floor next to Silver-street contains an assembly-room, 64 ft. long by 26 ft. wide, with a separate stone staircase at the west end for the audience. At the opposite end of this room will be a platform, with an entrance to it from the central staircase of the club. Adjoining this staircase and over the Silver-street main entrance is an ante-room, approached from the central staircase. At the corner is a hexagonal-shaped room for honorary members, with a balcony outside. The Broad-gate wing contains on the first floor, over the card-room and bar, a billiard-room, and over the smoke-room is another billiard-room. On this floor there are lavatories placed. Over the ante-room and honorary members' room, on the second floor, there are three bedrooms for the caretaker. The basement on the Broad-gate side is occupied by stabling for about thirty bicycles, and on the garden side is a skittle-alley, the latter, as well as the lavatories, being lined with white-glazed bricks. Advantage has been taken of the acute-angled corner formed by Silver-street and Broad-gate to obtain a hexagonal turret, surmounted by a lead-covered dome. The builders are Messrs. M. Otter & Co., Lincoln, and the architect is Mr. William Watkins, Lincoln.

BANK CHAMBERS, GATESHEAD.—New buildings, to combine the premises of the North-Eastern Banking Company, and the Gateshead offices of the Gas Company and also of the Water Company, have just been completed at Gateshead. The building, which is known as Bank Chambers, is three stories in height. The first is fronted with stone, the remainder of the building being of red bricks with mullion windows and stone facings. On the ground floor, with the entrance in High-street, is the new office of the North-Eastern Banking Company. The strong-room of the bank is constructed of concrete, in the basement of the building. Separated from the bank by a passage, are the new Gateshead offices

of the Newcastle and Gateshead Gas Company, the entrance to these, as well as the entrance to the other portions of the building, being from Swinburne-street. There are cellars beneath the Gas Company's premises. The chambers have been built from designs supplied by the firm of the Mayor of Gateshead, Messrs. Thompson & Dunn, architects; Mr. Thos. Hutchinson, Gateshead, has been the contractor; Mr. John Murray, Gateshead, has done the plumbing; Mr. Scurfield, Gateshead, the painting; and all the ironwork has been supplied by Councillor Hindson, of that borough.

NEW CHURCH AND BUILDINGS, BROMLEY, KENT.—These new buildings, erected near the corner of Freeland and Upper Park-road, have just been completed, and were dedicated on the 25th ult. The buildings, which occupy a site in Freeland-road of 150 ft. by 70 ft., form one of the latest and most important extensions of the Presbyterian Church of England, and comprise—a cruciform church seated for about 720; a hall to accommodate about 240, and so arranged that it may easily be divided into separate class-rooms for Sunday-school purposes, by movable screens; and a complete suite of rooms for vestry, session, &c., being of oak. Steel principals and purlins are used in the construction of the main roof. At the north-west corner there is a tower and spire 118 ft. high. The style of architecture adopted is Early Gothic, of the twelfth and thirteenth-century type, semicircular arches being frequently introduced. Mr. John C. T. Murray, of Westminster, is the architect, and the quantities were prepared by Messrs. W. H. Barber & Son, of Adelphi. The general contract has been carried out by Mr. John Bentley, of Waltham Abbey; the gas-fitters' work by Cannon & Sons, of Southwark; the heating by Musgrave & Co., London and Belfast; and the wood-block flooring is on Charteris & Longley's system. The organ is by Bevington & Sons, of Soho. Mr. George Barber acted as clerk of works.

RENDCOMB PARISH CHURCH.—The parish church of St. Peter's, Rendcomb, Gloucestershire, was reopened on St. Peter's Day, after undergoing considerable alterations from the designs of Mr. F. R. Kempson, architect, of Hereford and Cardiff. New oak fittings, elaborately carved and wrought, have been provided throughout, a new vestry and heating-chamber built, and some interesting features brought to light, amongst them being portions of a thirteenth-century arcade, and the north doorway of the nave. Messrs. Collins & Godfrey, of Tewkesbury, were the contractors.

CONCERT HALL, BIRKENHEAD.—It has been decided to make an addition to the Cloughton Concert Hall, Birkenhead, which comprises a large promenade-room. The contract has been let to Messrs. Lachlan & Batkin for 600*l*. The plans have been prepared and the work will be under the superintendence of Mr. T. Tallies Rees, architect, of Birkenhead.

NEW PAROCHIAL HALL, ST. MATTHEW'S, BAYSWATER.—This building, the foundation-stone of which was laid by H.R.H. Princess Christian in December last, has now been completed. It consists of an apartment divided into a nave and side aisles by timber pillars and arches, and covered by an open roof boarded internally, due provision having been made for seeing and hearing. A platform at the west end has been planned, capable of increase when required, for the varying meetings that will take place. The half basement is fitted up as a gymnasium, with a wood-block floor and partially boarded walls. Behind it is a committee-room with separate approach, and in the rear is a kitchen adapted for service of tea-meetings and similar gatherings. There is ample lavatory accommodation for the use of the gymnasium. Two separate staircases lead to the main hall, of fire-proof construction, and two are provided in like manner to the gymnasium. The buildings have been erected by Messrs. Allen & Sons, builders, of Kilburn, under the superintendence of Mr. E. P. Loftus Brock. The style is that of the beginning of the seventeenth century, the angles being of red brick, while the same material, in contrast to the yellow brick of the general walling, is freely used, with an admixture of Bath stone in bands and strings.

UNION CHAPEL, LAVENDON.—The new Union Chapel at Lavendon has just been opened. Mr. Charles Dorman, of Northampton, was the architect; and Mr. H. Lay, of Lavendon, has carried out the work. Local stone has been used in the building of the chapel, and accommodation has been made for upwards of 150 persons.

CHAPEL, WALSALL.—On the 27th ult., Bridge-street Chapel, Walsall, which has been closed for some time for alteration and renovation, was reopened. Last November the new work—designed by Messrs. Bailey & McConnell—was begun, and it has consisted of the erection of a new front, the putting on of a new roof, together with various internal alterations to add to the convenience and safety of the building. The new front is in red brick and

* *Tb Builder*, Jan.-June, 1888.

terra-cotta in English Renaissance design. The total cost of the work has been about 2,000.

SANITARY OFFICIALS' CHAMBERS, GLASGOW.—On the 25th ult., the memorial stone of the new buildings for the sanitary officers of Glasgow was laid. The new offices will be situated at the corner of Montrose-street and Cochrane-street, a short distance from the old premises, and only a few yards east from the Municipal Chambers in George-square. Designed by Mr. A. B. McDonald, City Engineer, the new building will be of three stories, with a square tower rising to a height of 70 ft. at the corner where the two streets meet. The front elevations will be treated in the style of the Italian Renaissance. The first story is already completed, and has rusticated courses and round-headed windows. Above the main cornice the sky-line is broken by a balustrade, interrupted at intervals by peditments and finials. The estimated cost of the new chambers is about 17,000, and the site cost 11,000.

PRIMITIVE METHODIST CHAPEL, COVENTRY.—On the 27th ult., the new chapel in Ford-street, Coventry, was opened. The plans for the new chapel were prepared by Mr. John Wills, of Dudley. Mr. J. Worwood's tender for 1,730*l.* was accepted for the erection of the building. The building is in the Gothic style, and the materials used are red brick, with Bath stone dressings. The accommodation comprises a chapel on the ground floor, 56 ft. by 33 ft., with school-room, four class-rooms, and vestry, partly in the basement. The principal entrance to the chapel, which is approached by a flight of steps, is from Ford-street. The front of the building is gabled, with an octagonal ornamented pillar at each end, finishing with a cusped finial. The sitting accommodation within the chapel is for about five hundred persons, this being provided without the introduction of galleries. The choir is accommodated on a raised platform at the end of the chapel immediately behind the rostrum, with the organ chamber to the left. The seats and woodwork of the interior are of pitch-pine varnished.

PRESBYTERIAN CHURCH, CARLISLE.—On the 27th ult., Fisher-street Presbyterian Church, Carlisle, was re-opened after alteration and enlargement. The front of the building is in three planes, the towers containing the gallery staircases, on either side of the main front, projecting about a yard towards the street. Each of the gallery staircases has a separate entrance from the outside, and communicates also with a large central vestibule. The chief feature of the front gable is the two-light window over the entrance gable. The two towers on either side are terminated by high-pitched roofs, covered with green slates and ornamental cresting, and screened by battlemented parapets.

The church roof is in three sections, the nave being a large central vestibule, the gallery on either side, and a large open roof over the nave of the church. The ceiling is divided up by ornamental principals into seven bays, which are again marked out into diagonally boarded panels by wrought mouldings. The upper face of the ceiling is flat, for acoustical effect, the ceiling being five-sided. Between the nave and gallery roofs, supported on columns, resting upon those carrying the gallery, is the clear-story, running along the whole length of the church, and having four lights to each bay. Each light is trefoil-headed, with a moulded pointed arch over the same, carried on circular columns with turned caps and bases, resting upon the clear-story sill, below which is a cornice.

At each side of the chancel is a two-light trefoil window. The glass has been removed from the whole of the old windows that remain, and new lead lights substituted. From the central vestibule, which is lighted by a couple of lancets on either side of the entrance and by the light window, and all the vestibule screens and doors are glazed with lead lights in ornamental patterns. The pulpit, which is the gift of the architect, is of oak, octagonal in form. The gallery, providing accommodation for 352, is entirely new, and is formed without trusses. The whole of the inside woodwork, with the exception of the oak pulpit and choir, is pitch-pine, varnished. Accommodation is now provided for about 800 worshippers in all. The total cost of the reconstruction has been 3,400*l.* The names of the various contractors and tradesmen are as follows:—Builders and carpenters and joiners, Messrs. W. & H. Davidson; painter and decorator, Mr. W. N. Ballantine; slater, Mr. J. Nanson; plasterer and ornamental work, Messrs. R. M. Ormerod & Son; plumber, Mr. W. Anderson; heating engineers, Messrs. Musgrave & Co., Ltd., Belfast; ventilating engineers, Messrs. E. H. Shorland & Bro., Manchester; stone carver, Mr. J. Hewson, Maryport; wood carver, Mr. Gandy; stained glass, Messrs. Swaine Bourne & Son, Birmingham; artists, Messrs. Swaine Bourne & Son, Birmingham; ornamental railing and fittings, Messrs. Cairns & Co.; brass and iron gasfittings, and brass pulpit and communion table desks, Messrs. Jones & Willis, London. The whole of the work was carried out under the immediate supervision of Mr. T. Taylor Scott, of Carlisle, the architect.

PRESBYTERIAN CHURCH, BELFAST.—The laying of the foundation-stones of the new Presbyterian church in Falls-road, Broadway, took place on the 29th ult. The outside dimensions of the church are about 90 ft. by 60 ft., and the main front is placed so as to face Broadway. A simple treatment of the thirteenth-century Gothic has been adopted as the

most suitable style for a church built mainly of red brick. The plan comprises a nave and aisles, with shallow transepts, session-room, heating-chamber placed at the rear. A vestibule will give access to the church and also to the galleries by means of wide staircases at each side. One of these will be contained in a square tower, several lancet windows affording light. At the belfry stage are four large splayed windows, with moulded arches, above which runs the boldly-projecting cornice of the spire. The latter is a square on plan, covered with copper, and terminating in a gilt copper weather-vane at the height of 130 ft. On the other side of the front is a gabled projection, with buttresses at the angles. A five-light traceried window forms the central feature of the front gable. A bold finial forms the termination of the gable at a height of 56 ft. All the windows have lance-shaped heads, and will be filled with cathedral glass in geometrical patterns. All the walling is of best perforated red brick, with red Dunfermlie sandstone, weatherings, sills, and dressings. In the interior five arches on each side of the nave rise above the galleries and support the roof, which is divided into three spans. Cusped and pointed arches form an arcade along the gallery front. A platform of pitch-pine and walnut will be placed in a recess in the front wall, under a moulded arch resting on engaged columns. All the internal joinery will be of yellow and pitch pine, varnished. Mr. Thomas McMillan, Belfast, is the contractor for the entire work, and the architects are Messrs. Young & Mackenzie.

MISCELLANEOUS.

TOURIST GUIDE TO THE CONTINENT.—This is a guide issued by the Great Eastern Railway Company for travellers *via* Harwich. It contains many maps, on which cycling routes are marked in addition to other features, and a good deal of useful information. It can be had at the Continental department, Liverpool-street Station.

CHANGES OF ADDRESS.—Messrs. Colledge & Bridgen, of Wolverhampton, ask us to mention that they have changed their address to 67, Church-lane, Wolverhampton. Messrs. Joseph Robinson & Co., the makers of "Robinson's cement," have changed their address, from 205, Phoenix-street, Somerset's Town, to Brewery Wharf, Bridge-street, Greenwich.

BRISTOL MASTER BUILDERS' ANNUAL EXCURSION.—The Bristol Master Builders' Association held their annual excursion on the 27th ult., visiting Bridgwater and the Quantocks. Mr. E. H. Hill, of Bridgwater, conducted the party to the various spots. Dinner was served at the Clarence Hotel, Bridgwater. Mr. George Wilkins (President) occupying the chair. Mr. W. H. Cowlin gave "The National Association of Master Builders," and remarked that the body appealed to their sympathies, and he hoped that it would be still more successful in the future.

Mr. Krauss replied, and urged that the Association was not in existence for the purpose of crushing workmen. Their principle was a good days work, and a good day's pay. They had had some trouble in the building trade in Bridgwater, but he thought that if they had had a society there the trouble might have been settled some time ago. Mr. Church also replied, and said that he was proud that the builders in every town and city should be affiliated to the Association. The Association took a great deal of trouble in going into every matter connected with the trade, giving advice, publishing rates of wages, accounts, the state of trade, and various other statistics. He hoped that before long Bridgwater would be affiliated. Mr. H. J. Sparrow, of Bridgwater, seconded the vote of thanks to Mr. Hill, which was carried with acclamation.

Mr. Brown gave "The Merchant Traders." Mr. May, in reply, said that, on behalf of the timber trade, he should like to say that the hopeful tendency was a great source of satisfaction. Many of them had their hands full—a great deal more so than in the depressing times through which they had passed.

Mr. Ambrose next gave "The Bristol Master Builders' Association," and remarked that the Association was formed for the advancement of trade interests. He wished the Association all success. The Chairman replied, and said that the Association was doing good work in Bristol. He thought that if it were not for the Association they would have had more trouble in Bristol. There was some trouble, but they were able to keep it under. Other toasts followed.

WOLVERHAMPTON DISTRICT BUILDING TRADES FEDERATION.—The half-yearly general meeting of the Wolverhampton District Building Trades Federation was held at the "Palm Horse" Inn, Dudley-street, on the 27th ult., the chair being taken by the President (Mr. P. Lalley). The first half-yearly report stated that the Federation had been called into existence by the fact that trades unionists in the building trade recognised the need for closer and more united action. They believed that the bond of union in the trade was firmer than it had been for some time past. A few little disputes had taken place, but as yet there had been none necessitating any loss of time.—The Chairman said that during the last six months there had only been one dispute, and that was settled amicably on a deputation from the Federation waiting on the master. The object of the Federation was to benefit all classes in the building

trade. The membership now numbered about 800, and there was no reason why it should not be increased to 1,000. The report was adopted. The following resolution was moved by Mr. Kelly, and seconded by Mr. Dudley:—"That we pledge ourselves to use every effort to insure the success of this Federation by inducing all workers in the building industry of Wolverhampton and district to become trades unionists." The resolution was ultimately carried.

NEW BUILDINGS FOR THE PARIS "FIGARO."—The proprietors of the *Figaro* have opened an architectural competition, limited to French architects, for designs for an important addition to their premises in Rue Drouot.

SANITARY INSPECTORS' ASSOCIATION.—VISIT TO PARIS.—The following is an outline of the arrangements proposed by the French Society of Sanitary Engineers and Architects:—Saturday, July 6, 8 a.m., a deputation from the committee of direction will meet the train at St. Lazare station; 11.30 a.m., breakfast at Eiffel Tower; 2 p.m., visit to the Sanitary Exhibition at Galerie des Arts Libéraux, near the Tower Eiffel, and visit to the Russian Exhibition, Champ de Mars. Sunday, July 7, 9 a.m., visit to the Irrigation Works at Asnières. Monday, July 8, 9 a.m., opening of the Congress; lectures and reports on "treatment of house refuse in cities," and other papers on sanitation; 5 p.m., visit to disinfecting stations. Tuesday, July 9, papers and discussion continued; 3 p.m., visit to the Sewage System of Levallois, near Paris; 4 p.m., visit to the Glass Works of MM. Oppert, at Cléchy. Wednesday, July 10, further papers on sanitary subjects; 2.30 p.m., visit to the Modern Girl-Lycée, in Paris; 4 p.m., visit to the Paris sewers. Wednesday evening, probably a banquet, at present under arrangement.

BREST HARBOUR.—The French Parliament has called for a vote of 8,100,000 francs in order to complete without further delay the works at the harbour and the port of Brest, which received official approval some years ago.

INSTITUTION OF ELECTRICAL ENGINEERS.—The conversation of the Institution of Electrical Engineers held on Wednesday evening last at the Galleries of the Royal Academy of Painters in Water-colours was a great success. Mr. R. E. Crompton (the President) and Mrs. Crompton received the guests. A great many well-known electricians and scientific men were present, the rooms being crowded. The band of Her Majesty's Royal Horse Guards gave musical selections during the evening.

ST. JOHN'S LODGE, FULHAM.—Messrs. Walton & Lee will offer for sale on the 16th inst. at the Mart, Tokenhouse-yard, the freehold property known as St. John's Lodge. The property has frontages to the North End-road and Epirus-road of 113 ft. 6 in. and 140 ft. 2 in. respectively.

INSTITUTION OF CIVIL ENGINEERS.—The Council of the Institution of Civil Engineers has reappointed Mr. Hugh Lindsay Antroub as Treasurer, Dr. William Pole, F.R.S., as Honorary Secretary, and Mr. James Forrest as the Secretary.

MONUMENT TO CARNOT AT NICE.—A monument to the memory of President Carnot has been erected at Nice, on the Place Cassini. The design is by M. de Courrière, architect, and is composed of a hemispherical base supporting a marble pedestal bearing a column of the same material, which carries a bronze portrait-bust of Carnot, to which a figure of a child offers a garland of flowers. The sculptural portion has been executed by M. Convent.

SKWAGE TARIFF.—The Council of the Institution of Civil Engineers of Ireland, has awarded a Mullin's Gold Medal to Mr. W. Kaye Parry, A.M.I.C.E., for his paper entitled, "The Application of Recent Advances in the Study and Treatment of Sewage."

LEGAL.

IMPORTANT POINT UNDER THE METROPOLIS MANAGEMENT ACT, 1854.

The case of Allen and another v. The London County Council came before Mr. Justice Wills and Mr. Justice Wright, sitting as a Divisional Court of Queen's Bench, on the 1st inst., for judgment, it being a special case stated by a Metropolitan police-magistrate, who made an order for the demolition of a building in the Metropolis as being beyond the building-line. The case was of some importance, as the substantial question raised being whether the decision of the architect as to the building being beyond the building-line was conclusive and binding on the magistrate.

The facts were as follows:—A complaint was made to the magistrate by the London County Council that the appellants began to erect a building beyond the general line of buildings on the north-western side of the Council, contrary to Section 75 of the Metropolis Management Act, 25 and 26 Victoria, cap. 102. It appeared that the appellants on November 13 last commenced to build four shops and houses upon the land at the corner of Berchington-road. The front in Berchington-road extended 16 ft. beyond the general line of buildings as determined by the certificate of the Superintending Architect of the London County Council, who stated in it that the main fronts of the buildings in a certain row of houses formed the general line of buildings

on the north-western side of Berchington-road, "in which road the building in question is situate, and the building in question would project beyond the prolongation of the said general line. On behalf of the appellants it was contended that the architect had not by his certificate found that the building was situate in the "street, place, or row of houses" described as the north-western side of Berchington-road, and that if he had so found, he had placed the building in a "street, place, or row of houses" in which the same was not situate. The respondents' contention was that the certificate had determined that the building was situate in Berchington-road, and that such determination was binding upon the Magistrate. The learned Magistrate felt bound by the decision in the case of the "London County Council v. Cross," and directed the demolition of so much of the building as was beyond the line. The questions for the Divisional Court to determine were (1) whether the certificate showed that the house in question was situate in the street, place, or row of houses on and for which the general line of buildings was determined; (2) Whether it was the duty of the architect to decide and find the situation of the appellants' building, and if so whether his decision was binding on the magistrate.

Mr. Justice Wills, in giving judgment in favour of the London County Council, said that the question raised was whether the certificate of the Superintending Architect of the London County Council, who now represented the Metropolitan Board of Works under the Metropolitan Management Act, 1862, deciding whether a particular building to which the building line applied in a street was decisive of the point in dispute. Looking at the Act apart from the Authorities, he (Mr. Justice Wills) would have thought the Tribunal to decide that was the magistrate. The matter had been much discussed, both in that Court and the House of Lords. It seemed to him that the authorities were not satisfactory. In the case of "Barlow v. Vestry of St. Mary Abchurch," decided in 1885, Lord Watson held that the architect was the person to decide, while Lord Bramwell held it was the magistrate. However, Lord Fitzgerald agreed with Lord Watson, and the majority of those learned Lords, therefore, were against the view that the magistrate was the deciding tribunal. In the case of the London County Council v. Cross, which was argued in a Divisional Court, Mr. Justice Denman and Mr. Justice A. L. Smith both adopted the view that the architect was the person to decide, but as that case was subsequently overruled on another point it could not be called a binding judgment, and it seemed better to follow the views of the majority of judges than to set up his own opinion. The point in question was not so important as it might seem at first sight, inasmuch as the Act of 1894 had made provision for the appointment of a tribunal of appeal against the architect. On the second question the architect must be taken as meaning to decide, and determining, that the building in question was in the street to which the building-line applied.

Mr. Justice Wright concurred.
Leave to appeal was granted.
Mr. Channell, Q.C., and Mr. Wedderburn appeared for the appellants; while Mr. Horace Avory and Mr. Daldy represented the respondents.

CAPITAL AND LABOUR.

THE CROYDON SCHOOL BOARD AND THE TRADE UNION CONTRACTOR CLAUSE.—The Croydon School Board met in committee on the 27th ult., to consider the subject of the memorial from the Croydon Labour Council for the insertion of a clause in all contracts issued by the Board, that the Trade Union rate of wages shall be paid, under penalty, and the rules and regulations of the Union enforced. A deputation from the Croydon and District Builders' Federation—consisting of Messrs. S. Page, J. Smith, and W. Pearson (Hon. Sec.)—waited upon the board with a memorial in reply to that of the Labour Council, in which they (the master builders) stated that "Croydon was included in a twelve-miles' radius in 1892 by an agreement between the Central Association of the Master Builders of London and the London Labour Federation and carried into effect without consultation with or communication to the trade interested in this arrangement. The Croydon and District Builders would not submit to the ruling and dictation of the London societies, they having no interest in the trade of the town. That to enforce the new arrangement a strike was ordered by the Federation, which took effect in November, 1892, and continued till about March, 1893, and which in its object. There has been several weeks a partial strike with the Federated men belonging to the London Labour Federation, and it is still going on, only a few men have been withdrawn, principally carpenters and joiners, to make disturbance in the trade, and it is submitted that, although a general call has been made upon the trade by the Federation to enforce the London rules, there has been no general response, and in many instances the men have elected to stand by the existing rules of working rather than be ruled over by a very small section of the trade. It is considered that the rate of wage and general working is more than equivalent to the London working

arrangement, and free from the dictation that has been so much practised by the exacting detail that has been adopted in several cases. That the Association would point to the fact that for upwards of thirty years there has been no friction in the trade, and also to say that wages and working country, and with slight difference to that of London. The Master Builders' Association consists of the principal builders of the district, numbering some fifty members; they have never recognised the London Federation rules as adopted by the Labour Council, and contend that the current rate as paid by the Association is generally satisfactory to the men." They also pointed out that the section making the application are a very small body, about one-third of the trade of the town, also that wherever such clauses have been adopted, no good results have been recorded. The Chairman produced a report from the Committee, recommending that the prayer in the memorial of the Croydon Labour Council be not granted, and in a formal manner moved its adoption, reserving to himself the right to vote as he thought fit. The Rev. J. Critchison seconded the adoption of the report.

The Rev. W. H. Randolph supported, stating that it was within his own knowledge that men as well as employers were opposed to the clause, and he had been asked definitely to oppose it. He had taken the trouble to consult working men, and had taken three trades—the bricklayers, painters, and carpenters—and he found them absolutely against the Union in any one of its forms, they abhorred it, and could not stand its domination, and dictation, and coercion. He found that the Unionists represented about one-third of the working men. In one case over 200 men were employed, and only eight of them were Unionists, and he knew of another case in which the contractor absolutely refused to employ Union men.—Mr. W. V. Smith moved an amendment, that the prayer of the memorial should be granted, and Mr. Mackenzie seconded, but upon being put to the meeting it was lost, and the report was agreed to.

MEETINGS.

SATURDAY, JULY 6.

Liverpool Engineering Society.—Excursion to the Snowdon Mountain Rack Railway, in North Wales.

MONDAY, JULY 8.

Royal Institute of British Architects.—Special general meeting (for members only) to receive and consider a recommendation of the Council to establish a class of subscribing members, to be called "Craftsmen," and to make and adopt by-laws which shall define, regulate, and prescribe the conditions of membership and the mode of election and admission, and the privileges, obligations, and benefits of, and the payments to be made by, the proposed new class. 8 p.m.

Larks of Working Association (Carpenters' Hall).—Monthly meeting 7.30 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

9,836.—BRICKS: *J. Cycle and others.*—This patent relates to the facing and enamelling of bricks other than fire-bricks by using low fusion glazes, enamels, and clays. No particular method of application is given.

9,893.—FANLIGHTS: *W. P. Burgess.*—This invention consists of a metal plate, having a slot up its centre, and fastened by means of screws to the outside of the inner frame of the fanlight. A second metal plate is swivelled to the outer frame, and has a projecting stud, or pin which slides in the slot above mentioned and holds the fanlight in an open position.

7,924.—PARTITIONS: *E. Reis.*—Relates to the shape and arrangement of the panels of partitioning walls and partitions of buildings. The stones are made with triangular or polygonal-shaped edges, and are arranged in rows with the slanting sides downward, so as to form wedge-pieces.

12,837.—WINDOWS: *H. Holmes.*—Consists in improvements in sash-windows by having (1) the inside linings, together with a portion of the staff-head, held in position by hinges and bolts; (2) each sash is hung by a single cord which passes down each side in a rebate, and is continued under the sash in a groove; weights being at each end of the cord, the window is practically supported at its lower corners; (3) the parting head is made removable, and the window can be swivelled on a bolt and socket arrangement fixed near the bottom.

13,394.—WINDOWS: *M. Pusey.*—Deals with the sashes of sliding-windows, which are hinged on one side and have a part sliding in grooves inserted in the pulleys. A hooked bead, secured to a hinged piece and mounted on the other stile of the window-frame, is made to enter a groove in the lower sash, when same is closed, by the action of a projection or guard formed on the hinge-piece beforementioned.

15,856.—HOUSING TIMBER: *A. Slater.*—Pertains to a machine capable of being driven by power for housing timber between narrow rails of the roof. The apparatus consists of revolving cutters arranged to a frame or grip for holding the timber to be housed, and is furnished with rollers on either side to facilitate adjusting of the timber. The cutter consists of a blade fixed on a revolving head, which has horizontal and vertical motions, and can be fitted with stops to regulate the stroke in either direction.

7,261.—TILES: *A. Kienchen.*—Relates to a ridged roofing tile with a serrated or bevelled edge. The tiles overlap each other with undulated rebate like joints at their longitudinal edges. At these junctures two projecting ridges on one tile are arranged to bear firmly against corresponding depressions in the adjoining tile. Between these points of contact certain spaces are left for ventilating purposes.

7,459.—BRICKS: *G. Bailey.*—Relates to bricks having a square frustum-shaped projection on their upper sides and corresponding hollows on their lower sides, so that they are vertically locked together when laid.

NEW APPLICATIONS FOR LETTERS PATENT.

JUNE 17.—11,722, T. Phlips, Water-pipes to Prevent Bursting from Frost.—11,729, W. Shaw, Ventilating Houses, Theatres, &c.—11,744, W. Green, Ventilation of Public Buildings, &c.—11,761, A. Fossel, Machinery for Cutting Wood for Builders' Laths, &c.—11,776, J. Hargreave and S. Cooke, Supporter or Fastener for Window-sashes, Sliding Doors, &c.

JUNE 18.—11,809, J. Hunt, Holding Doors Partially Open when on the Chain.—11,859, W. Hall, Spring Devices for Counterbalancing Window-sashes, &c.

JUNE 19.—11,896, C. Monday, Vertically Sliding and Retaining at any Level Window or other Sashes or Doors without Sashes or Weights.—11,907, E. Fletcher and J. Carran, Fasteners for Windows.—11,919, H. Squill, Bolts and Fasteners for Doors, Windows, &c.—11,930, H. Sadin, Employment of Schist in the Manufacture of Bricks.—11,934, J. Birchall and J. Astley, Furnaces of Ovens, Kilns, &c.

JUNE 20.—12,022, W. Akerman, Roofing Tiles.

JUNE 21.—12,051, A. Franklin, Securing Door-handles.—12,056, H. Dolson, Automatic Sash-lift or Quadrant.—12,064, E. de la Sausse, Metal Window-frames.

JUNE 22.—12,118, T. Westley, Draught, Dust, and Weather Excluder for Doors.—12,152, W. Schuschitz, Reproducing Mouldings on Plane Surfaces.

PROVISIONAL SPECIFICATIONS ACCEPTED.

9,825, T. Sabine, Sockets of Pipes for Drainage, Sewer, &c.—9,971, T. Boun, Brick-making.—10,149, C. Marston, Slabs for Covering Ceilings and Partitions.—10,287, W. Kershaw, Water-pipes.—10,352, G. Shaw and others, Plaster of Paris.—10,555, C. Raleigh, Boring-bit for Rock-drills.—10,570, W. Bates, Construction of Windows.—11,267, W. Stark, Cement.—11,394, T. Sylvester, Windows.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

13,359, W. Matthews, Combination Inlet and Outlet for Baths, &c.—14,566, W. Griffith, Butt and Hinge for Doors and Gates.—15,811, F. Jacks, Back Draught-preventing Chimney Top and Ventilator.—23,211, W. Craicksbaaks, Windows and Window-cases.—471, G. Grossheim, Stencil-board for Painters and Decorators.—5,127, P. Rodoff and D. Rodoff, Fastening Devices or Clamps for Various Purposes, &c.—9,013, J. Howard, Tools for Making Frames.—9,714, W. Wise, Glass-plates.—9,761, W. Appleford, Flushing Apparatus for Water-closets, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JUNE 20.—By C. L. Lilley: 30, Woodfield-rd., Paddington, 1, r. 301, 450s.; 53, Sutherland-av., ut. 68 yrs. g.r. 111 (sold privately).—By J. F. Stomelberg: 2, Camden gardens, Kenilworth, ut. 271 yrs. g.r. 61.8s., 325s.—By Tabernacle & Son: 15, Goldington-st., St. Pancras, ut. 49 yrs. g.r. 104, r. 504, 390s.; 26, 28, and 30, Aldenham-st., Somers Town, ut. 25 yrs. g.r. 154, 600s.; 31, Chilton-st., St. Pancras, ut. 34 yrs. g.r. 184, r. 301, 320s.; 82, Chalton-st., and stable, &c., ut. 34 yrs. g.r. 244, 440s.; 2 and 3, Crawley-mews, Somers Town, ut. 48 yrs. g.r. 1, 481, 250s.—By Newton & Co.: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 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JUNE 21.—By Cane & Co.: 24, Pepp's-rd., New Cross, ut. 63 yrs. g.r. 101, r. 601, 455s.; 121 and 129, Albert-rd., Peckham, ut. 70 yrs. g.r. 111, r. 714, 555s.—By T. entom, Bull, & Cooper: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464,

[Contraction *used in these Lists*.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

LONDON.—For constructing new offices for the boys' and girls' departments of the Ealingham street School, Wandsworth, and for raising the soil, drains and a portion of the surface water drains, providing ventilation, &c., for the School Board for London. Mr. T. J. Riley, Architect. £1,800 0
P. G. Munro £1,800 0
W. Hammond 1,750 0
Lathbury Bros. 1,600 0
J. Marsland 1,585 0
* Accepted by the Works Committee.

NELSON.—For extension of 3-in. water main at Nelson, for the Capherly Urban District Council. Mr. A. O. Harper, Engineer and Surveyor. £180 10
Jones & Thomas £180 10
T. Street £165 7 6
J. W. Davies 170 5
Barnes, Chaplin, & Co. 150 0
C. S. Brewer 150 10
Wm. Phillips 149 11
* Accepted.

OSWALDTWISTLE (Lancs.).—Accepted for the erection of premises for the Liberal Club, Rhylings street. Messrs. Haywood & Harrison, architects, Accrington. Quantities by the architects.

Bridgway and Masonry.—Jas. H. Critchley. £100 0
H. Critchley £100 0
Carpentry and Joinery.—George Walcott. 85 14 6
Oswaldtwistle 797 3 7
Painting.—John Sudall, Oswaldtwistle 16 0 0
Siding.—Thos. Percival, Oswaldtwistle 12 11 0
Plastering.—George Eastwood, Accrington 71 13 0
Ironpaving.—J. W. Bridge, Accrington 24 15 0
Heating.—Approx. estimate 35 0 0
£550 19 1

PANGBOURNE.—For alterations to post-office, Pangbourne, for Mr. Clifford. Mr. J. S. David, architect, Reading. £340 0
Gottrell & Son £340 0
Boxall & Son 307 0
Goodall (accepted) 301 19

PAIGNTON.—For erecting and completing Paignton Wesleyan Chapel in Palace-avenue, for the Trustees. Mr. Walter George Coudrey, architect, of Paignton. Quantities by Mr. Vincent Catermole Brown, of Paignton. £1,014 14 6
Webster & Maund £1,014 14 6
W. Webster & Son 2,229 13 0
S. R. E. New 2,185 0
H. R. Babbitt 2,025 0
K. Yen 2,014 0
* Accepted.

PENRHILWER (Glam.).—For the erection of 2 or 3 more houses, for the Friends of Glamorgan Building Club. Messrs. Griffiths & Jones, architects, Town Hall Chambers, Ton-y-pandy, and Pen-y-pont. £1,110
Glock Bros. £1,110
Jno. James 3,055
Ed. Evans & Sons 3,007
* Accepted.

RAINFHILL (Lancs.).—For additions to No. 5 ward at the county asylum, for the Lancashire Asylum Board. Messrs. Grayson & Gold, architects, 31, James street, Liverpool. £474 0
Hughes & Stirling £474 0
Pater Tyson 2,973 0
R. Neill & Sons 2,580 0
W. Tomlinson & Sons 2,084 0
Brown & Backhouse 2,025 0
W. Thornton & Son 1,950 0
John Shaw 1,950 0

REDWICK (Mon.).—For the construction of a sea-wall, 475 ft. in length. Mr. Tegomah Rees, C.E., Corn Exchange-chambers, Newport, Mon. £3,017 9
T. Goldworthy £3,017 9
Lawson 2,802 11
W. Payne 2,421 9
Jas. Meyrick 2,372 12
Geo. Williams 2,341 6
Dixon Bros. 2,302 13
* Accepted.

ROTHWELL.—For the supply of road materials, for the Urban District Council. Mr. W. I. Pearson, Surveyor, Rothwell, North's. Granite.

	At Doncaster	At Rotherham
	Station	Station
	Per ton	Per ton
Ellis & Eward, Leicester	8 9	7 8
J. E. & S. M.	8 9	7 8
Monmouthshire Granite Co.	8 9	7 8
Chif. Hill Granite Co.	8 9	7 8
Leeds Granite Co.	8 9	7 8
(Genl.) L. Van Parys & Co.	8 9	7 8
Bartholomew & Enders	7 11	6 2
Granite Co.	7 9	5 2
Roby Granite Co.	7 9	5 2
Eudaly and Stony Stanton	7 9	5 2
Granite Company	7 9	5 2
Kawson & Rawson	7 9	5 2
Kettering Iron and Coal Co.	4 6	4 4

ST. HELEN'S (Lancs.).—For the erection of business premises, for the St. Helen's Cooperative Society, Ltd. Mr. F. S. Brann, architect, Whittle Chambers, Hardshaw-street, St. Helen's. Quantities by architect. £14,340 0
T. Rothwell £14,340 0
J. E. & S. M. 14,215 10
Frank Chalk 13,771 0
J. Shaw 13,728 0
Wm. Molyneux 13,728 0
J. Walker & Son 13,450 0
* Accepted.

SHEFFIELD.—For the supply of cast iron water-pipes, for the Worksley Rural District Council. Mr. C. F. Beaumont, Surveyor, Worksley, Gremose, Sheffield. Contract No. 1.

	Per ton.
Newton, Chambers, & Co., Thorncliffe, Sheffield	£4 5 0
Stanton Iron Co., Stanton, Nottingham	£4 6 0
" " " " " "	£4 6 0
Wm. Bell & Son	£4 6 0
Jas. Trippett	£4 6 0

SWINTON (Yorks).—Accepted for the construction of sewers, &c., for the Urban District Council. Mr. R. Fowler, Surveyor, Swinton. George Eyre, Sheffield. £110 6 4

TONY-PANDY.—For building additions to the Royal Hotel, for Mr. F. Thomas, Messrs. Griffiths & Jones, architects, Ton-y-pandy and Pont-y-pandy. £534 0
Charles Ross £534 0
Thos. Old, Ton-y-pandy (accepted) 565 0

TWICKENHAM.—For sundry works to river embankment of Paulist Lodge, Twickenham, for Mr. P. B. Burgynne. Mr. Walter I. Elbette, architect, 15, Strand, W.C. £1,500 0
Ford & Son £1,500 0
J. J. Mearns £1,500 0

WELLINGBOROUGH.—For the construction of sewerage works, East Barton, for the Rural District Council. Messrs. Sharran & Archer, architects, Market-square, Wellingborough. £1,500 0
N. Mannor £1,500 0
S. Hipwell £1,500 0
G. Young £1,500 0
W. Smart £1,500 0
W. G. Willmott £1,500 0

WESCOTT (Bucks.).—For the erection of an assembly hall, for Mr. J. H. Taylor. Mr. Gust Lueckert, architect, Aylesbury. Mr. Marley—Accepted at the Architects' Compendium Schedule for 1895. [No competition]

WOODFORD GREEN.—For sanitary works at Woodford Green, Essex, for Lady M. Charteris. Mr. J. D. Hooper, surveyor, Woodford. Quantities by the surveyor: £1,229 0
W. C. French £1,229 0

WOODHALL SPA (Lincs.).—For the erection of a cottage on sewage farm, for the Hunsall Rural District Council. Mr. Herbert Walker, C.E., Nottingham. Quantities by architect. William Jackson. £231
Oliver Cromwell, Woodhall
Walker & Hensman £231

TO CORRESPONDENTS.
L. & H. (too late: next week).
We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.
We cannot undertake to return rejected communications.
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The Representation of Architecture at the Royal Academy: concluded.



LAST week we commented briefly on this subject, giving quotations from some letters which we have received from various architects in regard to it. On another page in the present issue will be found extracts from a number of other letters which we have received. They present a curious medley of varying opinions, the one point on which the writers seem to be practically unanimous being the unsatisfactory nature of the architectural exhibition as at present arranged.

Several of our correspondents touch on the question "for whom are the architectural drawings exhibited?" and those who do so in most cases intimate that the exhibition is for the public and not for architects; that therefore the form of architectural illustration should be that which the public can best comprehend; and that this means, almost necessarily, either perspective drawings or photographs. We are unable to agree with either element of this conclusion. We consider that the architectural drawings are, or should be, both for architects and the public; but, so far from considering that therefore drawings should be admitted which may interest the public but which are of no value to architects, we hold that the public should learn to understand the class of architectural drawings which are of interest to architects, and that no others are worth hanging. It seems to be argued by some of our correspondents that the Royal Academy Exhibition generally is mainly arranged and got up with a view to popularity, and though we fear there is too much truth in this, we certainly do not believe that it is altogether true; and if it were, the conclusion would only be that the Royal Academy was not doing its duty to art. It is the business of an Academy of Arts to lead public taste, not to follow it; and if it were proved ever so much that this were not the case in regard to the bulk of the annual exhibitions, that is nothing to the argument. As far as the Architectural Room is concerned, as one of our correspondents trenchantly puts it, it is the duty of the

Academy to decide what is good architectural design, and to give the preference to it in the hanging. To this point we will return.

In the meantime there is the question, what are the kind of drawings which have the best chance for exhibition at the Royal Academy? Our correspondents offer us almost every possible opinion on this point. Several of them strongly support photographs of buildings, as being, in their opinion, the only manner in which architectural design can be truthfully and completely represented except by the actual building itself. This view is supported by some of those who regard it as a main object of the exhibition to interest the public. In that case we hold that they are quite at sea. We believe that a room full of photographs of buildings would be more dull and uninteresting in the eyes of the general public than the Architectural Room at the Academy has ever been yet. Others consider that perspective views are best understood by the public, but as we maintain strongly that the exhibition is not to be arranged according to the taste, or ignorance (of architecture) of the general public, we need not concern ourselves with that argument. Others take a middle course, and say that, while regarding geometrical drawings as exceedingly important, they by no means wish to discourage perspective drawings, as long as they are accompanied by plans. The question of models is touched upon by several correspondents, two or three of whom, we observe, express dissatisfaction with them as being too like toys.

Out of all this collection of varying opinions, many of which are accompanied by remarks and criticisms of much point and interest, we cannot say that we have any difficulty in coming to our own conclusions, or that our previous convictions have been much modified by the result of the correspondence, though we must thank some of our correspondents for valuable hints and for calling attention to neglected points, and all of them for taking the trouble to record their opinions, which we have no doubt will be of interest to many of our readers. We are glad also to find our own convictions on the subject receiving strong support in some of the letters with which we have been favoured.

Our own opinion is strongly in favour of geometrical drawings exhibiting the whole

construction and detail of a design, for the precise reason, which several of our correspondents dwell upon, that architectural exhibits stand on a different footing from all the other contents of the annual exhibitions, in the fact that they are not the actual work but a representation of it. We are not concerned with the building but with the design for it. Therefore the drawings should be such as to have interest as exhibiting and explaining the intended design, in its essential qualities, not in its mere pictorial result. A set of drawings showing the development of the design shows what is in itself a reality, not a mere representation. As Mr. Pite pointed out in his admirable letter printed last week, the geometrical drawings may really exhibit and explain the design, the thought in the architect's mind, more thoroughly than even the executed building can always be trusted to exhibit it. The letters both of Mr. Pite and Mr. Baggallay bring out this point very well, and should be read together. It is only as subsidiary to the geometrical drawings and further explaining them that perspectives and photographs are of much value. Plan is an essential element in architectural design, not a mere condition of it. The pictures of buildings, as Mr. Baggallay puts it, enter into an absurd competition with the pictorial contents of the other rooms, and are naturally compared with them and found much less interesting. But, regard the drawing not as an end in itself, but merely as a means of showing the architect's intention, and they come into quite a different category. They are not an end but a means, and should be so regarded. The perspective or the photograph are useful additions in making the meaning more clear or (in the case of the photograph) in giving a realistic representation of the result. The objection to making photographs the main element in the exhibition, as some of our correspondents recommend, lies not only in the fact that photographs are inherently dull objects in an exhibition, showing a dead black and white effect instead of the colour of the building, but (as Mr. Campbell Douglas points out) they can only show a building which has been actually executed and finished. Now designs for buildings which have not yet been carried out may be of just the same value and interest, *quâ* design, as those which are completed. Pugin said an architect was an unfortunate person who was always imagining great things and

executing little ones—not because he could not execute the great ones, but because he was so rarely allowed the opportunity. Surely then the Architectural Room at the Royal Academy is just the place where he might be allowed the opportunity at least to show a grand architectural conception, even if there were little chance of its being carried out. In regard to models, those of our correspondents who touch on the subject show a very decided difference of opinion. Two of them regard models as rather like toys; two take an exactly opposite view. Mr. Prior, whose own model is one of the best points in this year's exhibition, thinks that all architectural exhibits should be either models made by the architect's own hand, to be ranked with sculptor's work, or artistic drawings by his own hand which can be ranked with the other pictures of the exhibition. But this view entirely ignores the fact, already insisted on, that architectural exhibits stand on a different level from other exhibits, in that they are not the real work but only a representation of it. No picture of a mere building can be equally interesting, as a picture, with a figure picture or a landscape; and even the model is after all not the building, but a miniature representation of it, and one which, owing to difference of scale, often conveys a very inadequate idea of it. Hence we are rather disposed to sympathise with those of our correspondents who regard models of a whole building as toys; and though we consider that it would be a great improvement to give more scope to the exhibition of models, we do not know whether in fact models of portions of buildings, showing the actual facts of detail to a tolerably large scale, would not be of more interest than miniature models of whole buildings.

As to what should be the quality and style of the geometrical drawings, there is also much difference of opinion. Mr. C. J. Tait considers that these need not be by the architect's own hand—they are only diagrams of the design—unless he thinks that he can do them better than he can get anyone else to do them for him. We are by no means disposed to regard the matter in this light. Drawing is *not* design; but architectural drawing, as a means of exhibiting either a design for a building which has not been carried out, or of a building which is not within reach, is a form of art in itself, quite distinct from pictorial art, and one which we would not willingly let die. Careful and finished geometrical drawing leads at least to thinking out every portion of a design, and therefore has its value to the architect himself as well as to those who wish to study his design apart from the building.

As to what ought to be illustrated in the Architectural Room we have a number of suggestions from our correspondents. Mr. Jackson thinks the main object should be to illustrate the year's work in architecture that has been actually carried out. This should be one object, but not the only one; otherwise we are left in this predicament—that a very poor building which has been carried out may be illustrated, and a much better one that has not been carried out may be passed over.* That would hardly be for the advancement of architectural design. We agree with those of our correspondents who think that drawings of ancient architecture have no proper place among the architectural exhibits, as long at least as the space allotted to them is so limited; nor the small drawings of what may be called "shop" designs by firms of stained glass manufacturers. In these latter there is, in fact, no interest whatever. Stained glass ought to be exhibited at the Academy in its actual make, not in drawings; unless, as one correspondent suggests, we had the cartoons. But here again the question of space comes in.

As to the complaints of want of principle in the selection, we are entirely in sympathy with our correspondents. It is impossible to guess upon what, if any, principle, the contents of the Architectural Room are selected. It appears to go mainly and in general by mere drawing, and one of our correspondents suggests that the object of the Hanging Committee is merely to select the drawings which will best satisfy their standard of pictorial effect. But this can hardly explain the matter entirely, since we have seen two drawings this year which were turned out, one executed by perhaps the first sketcher in black and white of the day, the other by admittedly the first water-colour artist in architectural subjects of the day. Both represented good architectural designs, and if our readers could compare these with some of those that are hung, they would easily perceive that artistic drawing could hardly be the standard. Possibly it is chance, or the size of the frames, that settles it. At all events, there is abundant excuse for all the hard things that are said in some of our correspondents' letters as to the selection, and every reason to demand that some better means of selection should be found. Two or three of our correspondents suggest that a jury of architects should be invited to assist the painter academicians in adjudicating on the architectural drawings. We think this would be an excellent method, but we feel certain that the Academy would never assent to it. Only, if they do not, they should at least select someone on the hanging committee who knows something of architecture, and give him the principal voice in the selection.

It is probably owing to the favour shown to mere drawing and to showy perspectives that there is such a prevalence of the vicious system of employing professional draughtsmen, and drawing by proxy, so that we see the absurd result of the same hand and style in drawings bearing five or six different names. So much has this proxy-drawing become a recognised practice that an architect who always makes his own drawings, and had one of them hung on the line, was greeted by another with the complimentary remark—"That is a charming elevation; who drew it for you?" If the system of giving more prominence to plans and geometrical drawings once obtained, no doubt some fashionable perspective draughtsmen would lose much of their means of existence; but then, to borrow Lord Sherbrooke's famous phrase—"Why should they exist?"

One important practical point is touched upon by several of our correspondents; viz., that the restrictions as to frames, &c., should be abandoned in regard to the Architectural Room. The Academy apply the same restrictions indiscriminately to water-colours and architectural drawings, which is only another part of the general misapprehension of the subject, architectural drawings being made with a different object from water-colour drawings in the ordinary sense. The demand of our correspondents is that unframed strainers should be admitted, as at the Salon, and (as several of them put it) that architects should be allowed a free choice as to the manner in which they think their designs can be best illustrated, whether by geometrical drawings, perspectives, or photographs. Architects know best how they can illustrate their designs, and painters are really no judges on such a point, the drawings being made for an entirely different purpose from the works which painters execute.

The demand for fuller illustration of designs by geometrical drawings, of course touches at once on the question of space. Two or three only of our correspondents profess themselves satisfied with the space now given, and they are persons who take a rather pessimistic view of the whole subject, and think there can never be much interest in the Architectural Room at the best. The suggestion which is made by one or two of our correspondents, that the architectural

drawings should be distributed through the centre portion of the various picture galleries, is one which would never be listened to; they would be very much in the way of the often large crowd of visitors, and would interrupt the view of the larger pictures, the effect of which is often best realised from a little distance. The suggestion of one correspondent, that Gallery IX. should be devoted to architecture, would not afford much more space, but it would have the advantage that the architectural drawings would be in a room through which the visitors circulate, instead of in a *cul-de-sac*, and that (as one correspondent remarks) they would be placed near the sculpture, with which architecture has closer affinity than with painting. Our own opinion was expressed long ago, to the effect that the large Gallery III. should be devoted to architecture and decorative art, including architectural models and executed objects of art, such as silversmiths' work, jewellery, &c. If this were well carried out, we believe it would be found presently that this would become one of the most attractive galleries in the exhibition; but it is hopeless to expect this as long as the great majority of the Academicians are painters, who think of their own art before everything else. But there is a practicable middle course that may be recommended. Taking the suggestion of Gallery IX. for the architectural drawings, we might claim that architectural models should find space in the centre of the large Gallery III. We should then have sculpture, architectural drawings, and architectural models, ranged *en suite*, and the large gallery affords space on its floor for a considerable number of models.

We should like to suggest, in reference to the correspondence on the subject, that it would be a great advantage if some of those who express decided opinions in writing, would consistently illustrate their opinions in action. In an extract given in our last article from the letter of a very eminent architect, who is an Academician, he observes, while defending the use of perspective drawings, that "such perspective views might, however, be more frequently accompanied by floor plans than is now the case." Now the brilliant and effective water-colour drawings with which this architect illustrates his own buildings are, as far as we remember, never accompanied by a plan. In an extract from a letter printed in the present number, another well-known architect states that, in his opinion, "the worst of all ways of illustrating architecture is by an ornamental perspective," and he expresses his preference either for photographs of the building or for geometrical drawings. Yet his own works have been generally illustrated at the Academy, for some years back, by perspective drawings executed by an eminent professional draughtsman, whose style is always recognisable, who is not a member of the architect's office staff, and presumably had no hand in the designing of the building. If architects are so inconsistent in their practice and professions, it will be difficult to convince the public or the Academy that they are in earnest.

To sum up—there is no doubt, in this year as in other years, a certain amount of very interesting work to be found in the Architectural Room at the Royal Academy. But it is a mixture of all kinds of things, apparently selected and arranged on no principle of any kind; many of the drawings are not such as really to illustrate architectural design, but only architectural sketching; there is a wide-spread conviction that the selection is practically made by artists who have little interest in architecture; bad and vulgar designs are hung because they are shown in showy drawings which are not the work of the person who designed the building; the space allotted is insufficient for any adequate illustration of architectural design, and the room is one which the public does not ordinarily circulate through. In short, every care is taken to bring the pictures effectively before the public, and architecture is put into a corner where it cannot be

* On this point, like some others of our correspondents on other points, Mr. Jackson's practice does not quite agree with his words, inasmuch as his own principal exhibit in the present exhibition is a large drawing of a design which is not going to be carried out.

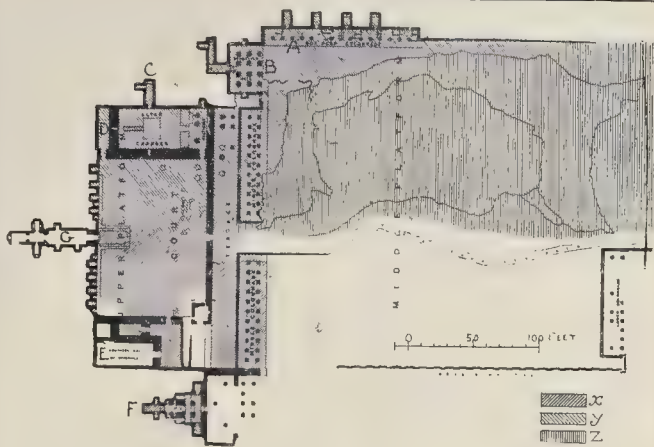
properly illustrated and where the public are not encouraged to go, and preference is given to pictorial drawings which cannot in the nature of things compete in interest with pictures properly so-called, while at the same time they are not the best means of exhibiting architectural design.

These, we think, are the main heads of the complaint. It is proposed by one or two of our correspondents that the architects should formally memorialise the Royal Academy on the subject. We think this would be a good course. It would at least compel attention to the subject, even if it resulted in no immediate improvement.

THE PRESENT POSITION OF THE LONDON WATER-SUPPLY QUESTION.

THE Dissolution has put an end, for the present, to the Water Bills of the London County Council. It is probable that the same result would have come to pass at the hands of the Select Committee had they had time to complete their labours, for the opposition of the districts outside the jurisdiction of the London County Council was so great and vigorous that it would have been difficult for the Committee to pass Bills which were repugnant to so many local bodies. Be that as it may, we now enter into another phase of this important matter. The recent attempt of the London County Council to obtain the control of the London water companies, in a piecemeal fashion, and without regard to the interests of suburban London, can scarcely be repeated. We have consistently advocated the control of the water supply of London and the immediately surrounding districts by a public body, but we have over and over again pointed out that this is a matter which is essentially one which should be dealt with by the Government. For it is only by the Government of the day that the question can be settled on a broad and fair basis. We have no desire to see the water companies make money out of the public, and we are quite alive to the weak points of these bodies. But there are a great number of persons interested in them, and no scheme will be satisfactory which does not deal with these interests in a just and equitable manner. It must always be a source of extreme regret to everyone who has at heart the well-being of London, that the scheme brought forward by Lord Cross when Home Secretary in a previous Conservative Government was not carried through. It is, in truth, to Sir W. Harcourt and his friends, who opposed that scheme, that the present *impasse* is largely due. But it is useless to cry over spilt milk; the matter has to be dealt with as it now is.

If the pecuniary value of the water companies has increased, so much the worse for the ratepayers of London, since it is certain that the latter will have to buy out the companies at their fair market value. It is one of the mistakes of the policy of the London County Council, that this body seeks to get the undertakings at a cheap rate—a policy which is both short-sighted and perfectly useless. Again, another thing is obvious: namely, that the longer the companies keep the control of the water supply of London in their hands, the larger will be the sum which the ratepayers will have eventually to give for the undertakings. In these circumstances, it will certainly be the duty of the new Government, if they are returned to power by the country, to introduce a measure by which the water supply of London and the suburbs shall be placed in the hands of one public authority. That authority must contain some representatives from the London County Council, but it is equally clear that other bodies outside the jurisdiction of the County Council must be given a fair representation upon it, with power for that representation to be increased as the population of the suburbs of London becomes greater. We confess we can see no insuperable difficulty in forming such a body, nor in formulating fair terms for the purchase



Plan of the Temple of Deir el Bahari.

A Colonnade of proto-Doric columns.
B Hypostyle Hall.
C Funerary Chapel.

D Northern Hall of Offerings.
E Southern Hall of Offerings.
F Harbor Shrine.
G Sanctuary.

x Portion shaded thus completely cleared by Mariette.
y Portion shaded thus completely cleared by E. E. Fund.
z Portion shaded thus partially cleared by E. E. Fund.

of the present water companies. There is another advantage in a measure for the establishment of a public water authority being introduced as a Government Bill, since the enormous expense of an inquiry in the case of a private Bill before a Select Committee will be avoided. Again, we may also point out that the present Government is peculiarly well qualified to deal with this matter. It contains Lord Cross, who has already mastered the subject, Mr. Ritchie, who passed the Local Government Act of 1888, by which County Councils were created in the counties of England, who is thoroughly familiar with matters of Local Government. Mr. Chamberlain and Mr. Powell Williams have been members of the Corporation of Birmingham, and can bring their municipal experience to bear on the interests of London, and in the Home Secretary, Sir Matthew White Ridley, there is a gentleman of great experience in local matters in the North of England, and who has been Chairman of various important Commissions and Committees. The time is ripe, and the men are here to give London the control of its own water supply on fair terms to the present companies. If the new Government does not seize this opportunity, the question must continue in its present unsatisfactory and uncertain state, the public interest will be injured, and the shareholders of the companies will be in perpetual uncertainty as to what is to be done to their property. We urge, therefore, on every elector that he should bring this question home to every Parliamentary candidate for a Metropolitan constituency, so that there may be returned to the new Parliament a large body of Members pledged to give the control of the water supply of London and the suburbs to a competent central authority—not the London County Council, but one which shall be representative of the entire area now supplied by the water companies of London and the suburbs. If there is shown a sufficient force of public opinion there is no doubt that such a measure as we have indicated will be brought forward by a Government which is pledged to improve the social condition of the people.

NOTES.

THE exhibition, at the rooms of the Society of Antiquaries, of the work of the Egypt Exploration Fund at the Temple of Deir el Bahari on the left bank of the Nile, is of some special interest to architects, inasmuch as it adds materially to our list

of examples of proto-Doric columns, the recent excavations having revealed a long colonnade (without entablature) of columns of the same type as Beni-Hasan, and a small Hypostyle Hall of twelve columns of the same type. This type of column is therefore beginning to assume more historical significance than when we only knew it as an occasional occurrence in very small groups. The columns appear to have been but roughly set out, but are in better preservation than those at Beni-Hasan. It is remarkable that although they are considerably later than the latter (the foundation of the Deir el Bahari temple being put at from 1400 to 1500 B.C.) the abaci appear to be thicker and more clumsy in proportion, and much less like the Greek Doric abacus, than those of Beni-Hasan. The accompanying small plan, reproduced from that attached to the guide to the temple published by the Exploration Fund, gives an idea of the rather peculiar arrangement of the temple and its subsidiary shrines; the plan, on a large scale, is hung in the Society of Antiquaries' room. The new proto-Doric colonnade is that on the upper side of the plan (A); adjoining, to the left of it, is seen the small Hypostyle Hall (B). Drawings, as well as photographs, of these portions of the temple are to be seen in the exhibition, as also numerous drawings of the painted subjects on the walls, a considerable number of mummies, and a good many tools and other implements of great interest, and some of them in a remarkable state of preservation. Those which are called "sacri-ficial axes" (they seem to us more like a form of adze) show a wide, thin blade of metal bound by narrow strips of tape-like material to a short, slightly-curved handle, the blade projecting backwards towards the holder, at an acute angle with the handle. Several of these are to be seen with the blade merely bound on to the wooden handle with these ligatures, which are in perfect preservation. A careful coloured facsimile of the painting on the north wall of the funerary chapel (C on plan) is one of the most interesting of the drawings. There is a curious instance of the "touch of nature" that makes us kin with these Egyptians of more than three thousand years ago, in the presence of a miniature mummy of a doll, which was found near a child's mummy.

IT is to be hoped that the meeting, held on Tuesday, at St. James's Palace, in support of the British School at Athens, at which the Prince of Wales presided, will have some effect in stirring up the Govern-

ment and public opinion in this country to a realisation of the discreditable position which England occupies, in comparison with France and Germany, in the endowment of archaeological research. The French school at Athens has an assured income of 3,000*l.* a year, the English school a precarious income of barely 500*l.* The French school has been carrying out investigations which have excited the interest of the whole civilised world; the English school has its hands tied from any work on such a scale because we cannot get it recognised in England that such objects are worth any expenditure of public money. We observe that the resolutions carried at the meeting did not contain any specific undertaking to appeal to Government for assistance; only a general expression of opinion that the British School merited support, and a pledge on the part of those present to do all in their power to put the School on a sound financial basis, "so that in dignity and efficiency it may worthily represent this country among the other foreign Institutes at Athens." A resolution like this, carried at so representative a meeting, forms a pretty good basis for an application to Government for support; and possibly may be efficiently used to that end. What is quite certain is that the present state of things is a disgrace to England.

IT is reported (but we have no official confirmation of the report) that the architect for the new Museum at Cairo has been selected, and it has been decided to carry out design No. 49, by M. Dourgon, of Paris. It may be remembered that equal premiums were awarded to four designs, Nos. 38, 46, 48, and 49. We expressed the opinion that the author of any one of these would probably be able to make a good thing of the building, and we remarked that No. 49 showed a very good plan. If the report is correct, we should therefore think the result satisfactory.

AN appeal is being made to the public for further funds to complete the work at St. Saviour's, Southwark. The funds in hand have been entirely expended in the first and main work of rebuilding the nave. The committee has yet about 3,000*l.* in promises (not due yet), and about 5,000*l.* more is needed for the completion of the interior, and until this sum is raised and expended the church cannot be opened for worship, though it is open daily to the public for inspection. St. Saviour's is not only the most important Mediaeval building in London, next Westminster Abbey, but it is to form also a kind of cathedral for South London, and it is to be hoped that the completion of the building will not be allowed to remain indefinitely adjourned for want of funds.*

THE Royal Archaeological Institute commences its annual meeting on Tuesday next week at Scarborough. On Wednesday, the 16th, the Association will visit Bridlington and Burton Agnes Hall; on the 18th they will go to Whitby; on the 19th to Beverley; on the 20th will be held the annual business meeting, and Malton and Kirkham Priory will be visited afterwards. On the 22nd visits will be made to Rievaulx and Helmsley, and on the 23rd to Lastingham Church and Pickering Castle.

WE much regret to hear that it is proposed by the Corporation of Bury St. Edmund's to utilise the interesting old Norman vaulted interior, known as the Moyses Hall, as a fire-engine station, a purpose for which we should not imagine that it was at all well suited, while in such an occupation the ancient work is almost certain to get knocked about and injured. A memorial is being got up in Bury St. Edmund's, asking the Corporation to make use of the interior as a museum of local

antiquities, a purpose for which it is very well suited, and in the fulfilment of which the building would be likely to be taken care of, and would appear in harmony with its surroundings. The Society for the Protection of Ancient Buildings is also, we hear, moving in the matter, and though we often have had to disagree with that body, they would certainly have our sympathy in this case.

THE remarks of Sir John Bridge, the very experienced senior Magistrate of the Metropolis, on the need for kiosques for the sale of newspapers, might very well be turned to practical effect by the authorities. They would do something to make the traffic of the streets more pleasant, and would not only do away very generally with shouting newspaper-boys, but would prevent the untidy selling of newspapers by vendors at some frequented spots, who deposit the contents sheet for inspection in the gutter. It is quite possible to construct a kiosk in a style which should make it sightly in the streets, so that not only would the public be able to purchase newspapers of various kinds, at specified spots, but no ugly structure would be required. From Sir John Bridge's point of view, the newspaper-boy of the London streets is on the road to ruin, so that the establishment of kiosques might be regarded not only as conducing to the comfort of the public, but to the well-being of the masses.

THE successful opposition of the Corporation of Dublin to the Bill promoted by the Dublin United Tramways Company to grant them power to adopt a trolley system of electric traction in Dublin has led to a good deal of bitterness on the part of the advocates of this system. The directors of the United Tramways Company thought that so long as they conformed to the regulations of the Board of Trade, the Local Authorities ought to be satisfied, hence there was no clause in the Bill empowering the Local Authorities to veto any proposed meddling with the streets. The right to use overhead wires so obviously concerns Local Authorities that any other result than the rejection of the Bill could hardly have been anticipated. The facilities for rapid transit offered by electric traction will make its introduction into Dublin merely a question of time; but some doubt still exists as to the particular system which will be adopted. The directorate by their injudicious action have delayed matters for a time.

THE cause of prevalence of enteric fever at Widnes has been the subject of a Report by Dr. R. Bruce Low to the Local Government Board, which results in fixing the evil on a bad form of privy and ashpit apparently peculiar to the district. No fault could be found with drainage or water supply, but the method of excrement disposal is by means of the midden privy system, and there is met with at Widnes a form of privy vault, of which a sketch is appended to the Report. The ashpit, in this case often uncovered, is above the privy vault, the top of which is arched over to form the floor of the ashpit. The excrement from the privy passes from under the seat down an earthenware or iron "shaft" into the vault, which is usually about 6 ft. deep and 8 ft. long. These shafts are always foul and coated with excrement. There is a door, opening on a level with the back passage, whereby the vault is emptied. Occasionally the brick floor of the ashpit (the roof of the privy vault) collapses, and there results a huge open cesspool, which is liable to foul the air in proximity to dwellings. This variety of privy is known as the "M.C." or more fully as the "Modern Convenience." It has, says Dr. Low, nothing whatever to recommend it, and is at present very properly condemned by the sanitary officials of the Borough of Widnes. In emptying the Widnes middens and vaults the wet

night-soil and refuse are often first of all thrown out upon the surface of the back passage, and then loaded into the Corporation carts. Some passages are too narrow to admit carts, and the filth is wheeled in barrows to the street, and there shovelled into the carts. The middens and vaults are emptied by the Corporation's men, four or five times a year. It is admitted that the surface of the passages or back lanes is seriously fouled by excrement on each occasion when the emptying takes place. These back passages have never been "made"; commonly they have a broken and soft surface, repaired occasionally with cinders or the like, and they have become saturated with filth, and children make them their habitual playground. "In a word, the air round the dwellings in Widnes is habitually fouled by emanations from collections of human and other filth stored close to the houses under very unfavourable conditions, and the tainted atmosphere that is there breathed by the inhabitants cannot fail to have an injurious effect upon them."

THE Metropolitan Public Gardens Association have in view the laying out of the at present closed burial-grounds attached to the churches of St. James, Pentonville, and Christ Church, in Blackfriars-road. The former church was built in 1788; there were buried Grimaldi, the famous clown, and R. P. Bonington, the landscape painter. Christ Church was originally built in 1670-1, on the bequest of John Marshall, who left 700*l.* for that purpose, upon part of the manor of Paris Garden; a steeple was added in 1695. The foundations having given way, the church was rebuilt, of brick, in 1738-41. Four years ago were added a new chancel, with organ-chamber and vestries. The body of the church was divided into nave and aisles by two arcades of red and white stone, and the rest of the structure was thoroughly repaired and strengthened. The latter works were executed by Mr. G. Dobson, of Colchester, after Mr. C. R. Baker King's designs (see the *Builder*, April 18, 1891).

THERE have been on view lately at Messrs. Campbell, Smith, & Co.'s premises, the first of a series of windows which are to be executed by the same firm for the important new memorial church at Berlin, to be erected to the memory of the late Emperor Frederick. As these designs have been selected in competition with German firms, we presume that English glass is thought somewhat highly of in Germany. The scheme, as a whole, suggests "Triumph over Death." It consists of three circular compartments worked into the upper part of a pointed arch, and having below four lancet-shaped divisions. The upper circular window shows "Our Lord Triumphant," with the Resurrection banner. The treatment of Christ as a three-quarter length figure is, perhaps, not quite happy for a leading subject. Below, in circular frames, are St. Paul and St. Peter, with their attributes, and, in order to carry out the general scheme, we have, in the four lower lancet-shaped compartments, St. Paul with Eutychus, Our Lord raising Jairus's daughter, Our Lord raising Lazarus, and St. Peter raising Tabitha. These as central figures are surrounded with an Early and rich conventional treatment of the Tree of Life, and having interwoven with it the Royal Shields of Germany and Prussia. The colouring throughout reminds one of Early English work, with strong and sharp contrasts in primary colours of rich hues. These are thrown up by being placed in a dark background, and will have, we think, a rich and very appropriate effect for the large building for which they are intended.

SITTING in the Consistory Court, last week, Dr. Tristram, Q.C., granted, upon an application made by the District Board of Works, a faculty for taking down the Belaysse monument, St. Giles-in-the-

* Subscriptions can be sent to the Bishop of Rochester, the Bishop of Southwark, Sir F. Wyon, Mr. Robert Barclay, or to the Lay Hon. Secretary, Mr. T. F. Field, at 54, Borough High-street.

Fields, and removing the portion which bears the inscription to where it will be protected from the weather. It was represented in court that the fabric which, now screened by hoarding, stands against the east wall (outside) of the parish church, and is built of stone and marble, has fallen into a decayed and dangerous condition. It was set up in 1736 by the two surviving daughters of the famous royalist soldier, John, first Lord Belsayse and Baron Worlabay, who died in 1689. We referred to the monument in a "Note" on July 9, 1892,* pointing out that it differs from the memorial described by Hatton, in his "New View of London," as standing within the chancel, north side, of the old church, and as having been erected there "Anno 1670 [sic] in memory of the Honourable John, Lord Belsayse." The inscription, transcribed, but not faithfully, by Hatton and others after him, records his three marriages, with their issue, and his signal military services during the Civil War. The stone in which it is cut will, in pursuance of the faculty, be placed inside the west door, if practicable, or, if not, in the crypt, of the church. A memorial tablet to Lord Belsayse was placed in the parish church at Worlabay, near Brigg.

THE consideration of the proposal to have a class of "craftsmen" in connexion with the Institute of Architects, which was discussed at a private meeting of the Institute, on Monday last, has been adjourned till next session. As might have been expected, cold water was thrown upon it by speakers, or by one speaker at all events, who may be said to represent the ultra-"professional" view of architecture, but nevertheless the opinion that it is too difficult a subject to be considered or settled in a hurry can hardly be contradicted. It will be found, however, that what satisfied architects in the glorious days when Earl de Grey was President is not likely to satisfy those who really represent the best thoughts and views of the present architectural period.

THE REPRESENTATION OF ARCHITECTURE AT THE ROYAL ACADEMY.

We give here a further selection of extracts from some of the numerous letters we have received on this subject. We have thought it best to give them in alphabetical order:—

MR. F. T. RAGGALLAY.

"The people who are satisfied with the present exhibition must, I think, peculiarly constituted, or entirely pessimistic.† It is not an exhibition of architecture, of course, and it is not even an exhibition of architectural drawing in any real sense of the term. It is an exhibition of more or less ambitious pictures of architectural subjects by amateurs, for architects are, and must generally be, amateurs at picture-making. I cannot but believe that much public indifference results from the fact that these amateur pictures enter into a sort of absurd competition with the more interesting, and much better executed, pictures in the other rooms; and I do not believe the exhibition could lose by dropping the gilt frames and the pictorial effects, even in the estimation of 'the public.' I rather join issue with those of your correspondents who think 'the public' cannot read plans; of course, there are dense persons who cannot do so, but my experience is that most people can and do understand plans, provided they are drawn clearly and not confused with a multitude of details—of course, not as fully as architects do, but enough to take an interest in them. Even sections, if they were got up in a similar clear style, would not, I believe, be beyond most amateurs. I have also some experience to go upon when I say that laymen take just as much interest in a perspective drawing or sketch on a small scale and with no pretension to pictorial effect as they do in our more ambitious pictures. So much for the public; as to the profession, it stands to reason we should like to see the working drawings, or something as nearly like them as

the author's vanity would allow him to show. I don't like models; it is prejudice, perhaps, but there is a sort of doll's-house childishness about them that grates—they seem waste of time, as it were. I am for enough geometrical drawings and sketches and photographs of parts to exhibit the building, as far as a building can be exhibited inside a room.

I am with those, too, who would throw out of the Architectural Room sketches of old work and small scale drawings of stained glass windows and decoration. Let us have the cartoons if they are worth showing, but the small drawings are no more real than our perspectives of buildings.

I cannot say I hanker for the perfection of finish of the Salon exhibits; it, again, seems like childish waste of precious moments. Students already spend quite time enough in mere drawing, and it has far too much influence on the judgment alike of laymen and professionals. What we want is to see what the building is, or will be, like, and to see how beautiful the drawings are—the architect's work, and not the draughtsman's."

MR. F. W. BEDFORD.

"I do not consider that architects have the same advantages in exhibiting their work as sculptors or painters.

In the first place I think the room is too small, and it should be one in the general suite and not a *cul-de-sac*.

As to the style of representation, I think that all restrictions should be removed, and that one should be allowed to send any form of illustration—photographs especially, which show the materials so clearly. Strainers should be admitted, and drawing in any kind of frame. . .

With regard to geometrical elevations, &c., I consider that the majority of buildings are better shown and more clearly understood by the public, and architects as well, if shown by perspective views—either photographs or drawings. An elevation may explain some buildings—street fronts, for instance—better than a perspective, but in a country house or detached public building, where grouping, outline, and general proportion are the chief things to aim at, a geometrical elevation is of very little use, and often very misleading.

Plans are always interesting, but if exhibited might often be unjustly criticised, as the reasons for certain arrangements are only known to the architect and his employer."

MR. JOHN BEGG.

"My feeling in the matter is that architecture at the Academy exhibitions must of necessity be inadequately represented, and in a manner not at all commensurate with its relative importance among the arts. Our gallery is the street—nay, the world!

Again, if we have exhibitions of drawings, then the nature of these drawings must depend on the object of the exhibition. If we wish to exhibit to the public, surely the perspective is the proper form for our drawing to take, the only form the public understands; if to our fellows, why then surely the detailed geometrical drawing is the fittest. In the former case must we not be content with the corner in charity allotted to us at the Academy, which is large enough alike for the numbers of the public who wish to look at our work and for the numbers of drawings worth their looking at; in the latter case, of an exhibition to be viewed by architects, would that not be more appropriately held by any other body than the Academy—say, by the Institute?"

MR. E. INGRESS BELL.

"It appears to me that the public never was attracted by an exhibition of architectural drawings, and I think never will be. To make the collection of drawings more technical by the mixture of plans, sections, and elevations, to the necessary exclusion of purely pictorial representations, would only puzzle and repel the public the more.

For whom is the display? For the public? Then let it be as pretty and peep-showish as possible. For the profession? Then let it consist of technical work almost entirely. In the former case the Academy is the proper locale; in the latter the Institute. But will architects contribute to a show where no clients are to be caught, and only their fellow architects enlightened?"

MR. R. A. BRIGGS.

"I think the amount of space placed at the disposal of architectural subjects to be totally inadequate, and, in my opinion, there should be two rooms, both of which should be at least double the size of the existing Architectural Room. One room should be for purely architectural sub-

jects. Sets of drawings should be hung, comprising geometrical plans, elevations, sections, and detail drawings, also a perspective or perspectives. Models should also be exhibited. The second room should be more for decorative works, such as decorations for interiors, stained-glass, designs for fittings and wall-papers, &c. . . I think also, that no perspectives should be admitted unless they have been actually made by the person in whose name they are hung, or, at least, by a member of the firm. It appears to me ridiculous that a drawing which is evidently made by one gentleman should be hung as the work of another. I am certainly in favour of more prominence being given to geometrical drawings, but at the same time I think it would be a very short-sighted policy to do away with perspectives, as, in my experience, I find that the public very seldom thoroughly understand a geometrical drawing, and it is only right we architects should put forward our designs in such a way that 'they are understandable of the people.' In conclusion, I suppose the only way will be for us to 'agitate' and present a petition to the Royal Academy authorities begging (1) for another room in addition to the existing one for architectural subjects, and (2) that more prominence should be given to architectural geometrical drawings."

MR. JAMES BROOKS.

"I believe there is always one architect deputed to make a selection, but how he is able to examine the large number of drawings in so short a space of time, I am unable to understand. There must be work enough for at least two, to do justice in the examination.

If the Academy would permit one outsider to be nominated by the President of the Institute, to be associated with the Academy architect, there would be a chance of architecture to be better represented than at present.

I am greatly in favour of geometrical drawings, plans, sections, and elevations being exhibited; in my opinion, many pictorial representations of buildings are very deceptive."

MR. BASIL CHAMPEYNS.

After observing that he does not think the space allotted to architecture at the Academy inadequate, because the evidence of the architect's work is his buildings, Mr. Champneys says: "It is, however, very desirable that such representations of buildings as are exhibited should be thoroughly *bona-fide*. The best representation of a building is a photograph, which necessarily gives a fairly accurate idea of the actual work. The next best is an unadorned elevation or section, with at least so much of a plan as may be required to explain the grouping of the building. The worst of all, as it seems to me, is an ornamental perspective, made in the usual *ad captandam* manner; often giving a very false idea of the actual work. Also the present system of exhibition is calculated to encourage in the public mind the idea that draughtsmanship is architecture, whereas it is nothing of the kind. It is possible that were the architectural exhibits limited as I would gladly see them to photographs and geometrical drawings, there would be less interest taken in the exhibition on the part of the general public than there is at present. But even as it is, the popular interest in the Architectural Room is so small as to be practically a negligible quantity. Few but architects seem to study the drawings, and architects would get far more insight into the quality of work, and consequently more instruction from it, if its illustration were limited by the methods I suggest."

MR. LANGTON COLE.

"There is, apparently, no classification or proper selection of the drawings submitted. I think the space might be increased by erecting a screen in the centre of the room, as I fear it is hopeless to ask for more wall-space. I consider that every design (except examples of flat decoration) should be accompanied by plans of the principal floors of the building represented; but I rather doubt the value of geometrical elevations, and I think sections would be out of place. I consider that the building should be shown as nearly as possible as it will look when completed, and I am, therefore, in favour of carefully-drawn and simply-coloured perspectives, except that buildings entirely of freestone might be shown in line. . . If elevations are exhibited, I should like them slightly tinted to express the colour, with some details to a larger scale to show the style of ornament."

MR. CAMPBELL DOUGLAS.

"In my opinion, what you call the 'pictorial' representations are in general too prominent, or

* See also a letter, signed "Royalist," in our issue of July 9, 1893, calling attention to its sorry state.

† Does not Mr. Raggallay rather mean to say that they are "optimistic"?—Ed.

rather, I should say, there are not enough of plans, sections, and elevations by which to judge of the first. On the other hand, it should be borne in mind that we exist for the public, rather than they for us. Hence architecture that is to be, if it is to be presented at all, must be shown in an attractive and natural way for the benefit of those who have not had professional training by which they might understand so-called 'geometrical' elevations. . . .

If a perspective be made on principles which do not violate natural conditions—if the horizontal line, on which all the corners, doors, windows, buttresses, &c., &c., are set out—be drawn in its true relation to the building, such as at eye level on level ground, or raised or lowered in the proper degree according as it is above or below one's eye; and if the whole view can be easily seen, say within 50 deg. or 55 deg., so that one does not require to turn one's head round as is done in viewing a diorama; in these circumstances, after making allowance for vertical diminution, we have in perspective as truly a geometrical elevation as in what is usually called by that name. Indeed, it is the only true and natural view of a building.

So I would have both "geometric" and "perspective" drawings of the same building, and would indicate the distance of the standpoint, the size of enclosing angle, and the level of the building site in relation to the standpoint of the viewer.

I agree with Mr. Jackson as to the superlative value of photographs, but you cannot photograph what has not been built."

MR. T. PHILLIPS FIGGIS.

"I am of opinion—

1. That the present representation of architecture at the Royal Academy is most unsatisfactory.
2. That, being a Royal Academy of Arts, and architecture the oldest and most important art, the largest, and not the smallest, room should be devoted to architecture, viz., No. 3 Room.
3. I consider that more prominence should be given to geometrical elevations, plans, and sections of designs, and that full-size cartoons of stained glass should be allowed, and the exhibition of models of buildings encouraged."

MR. F. T. W. GOLDSMITH.

"In reply to your letter of the 21st, I venture to hand you my views on the subject mentioned therein, as to question:—

Few can think the present arrangement satisfactory, either from an artistic or educational (i.e., public) point of view. Even those fortunate enough to belong to the set in favour at the R.A. this year cannot regard the exhibition as entirely representative, nor in any sense adequate; it is well known (or should be) that many drawings of buildings having great excellence and wide public interest were rejected. So much for the selection method and its results.

Located in an end room, reached by the picture-gazer after a long tramp through the "oil" galleries, how is it possible that the Architectural Room should ever contain more than half-a-dozen jaded loungers, leavened by two or three architectural students? . . .

The first change I would venture to suggest is that the room should be changed. At the end of the lecture-room is a small gallery (No. 9), now used for 'oils'; this I would like to see set apart for architectural works, and the oils transferred, with more wall space, to the Architectural Room. My reason for this is twofold: first, that the public would then pass through the Architectural Room, and the architectural exhibits would properly come near the sculpture. It would also have this advantage, that many architectural exhibits might be put in the lecture-room with the sculpture, suggesting, at any rate, a union of the arts, which is absent now! And as to exhibits—in place of many useless and uninteresting—even misleading—perspectives, I should like to see beautifully-finished sections; by that I mean to include the entire decoration and fitting up of the building. These should be accompanied by plans and elevations all to a reasonably large scale, and finished with the same care and end in view, viz.: to fully illustrate the finished work. As models of what can be done by mere sections and plans, I need only refer to the French schools. With a change of room and a sweeping alteration in the nature of the exhibits on the lines I have indicated, I feel sure we should have a popular architectural show and one that would help to put architecture in her proper relation with other arts. As to whether it would be possible, in the case of a building of more than usual excellence and size, to illustrate it by

means of models I cannot say. My own view inclines to finished sections and plans rather than to models which, at the best, can only be regarded as toys of a kind."

MR. J. A. GOTCH.

"I think more space should be allotted for architectural designs, and no drawing should be placed too high to be carefully examined. It is far more necessary to have an architectural drawing easily visible than an ordinary oil-colour picture, inasmuch as the small detail is of the essence of the interest."

While fully recognising that to a certain extent mere architectural draughtsmanship ought to find a place on the walls, I am convinced that the power of architectural draughtsmanship is not necessary to a power of designing architecture, and that it frequently gives an interest to the drawing which the building itself entirely lacks."

I strongly hold, therefore, that a far greater proportion of geometrical drawings ought to be exhibited, and that photographs of executed work, both general views and details, ought to form a recognised part of architectural illustration."

MR. C. HADFIELD.

"I am decidedly in favour of greater prominence being given to geometrical elevations, plans, and sections of architectural designs in place of merely pictorial representations of buildings."

MR. E. SWINFEN HARRIS.

"1. I think more detailed drawings, geometrical elevations, and, specially, plans showing good plotting and arrangement, would be far more useful to the profession than the mere pictures, frequently produced by persons not the real designers of the works illustrated, and which, being very costly of production, are prohibitive to many of the younger exhibitors, whose 'perspectives,' often of more artistic excellence, and far more truthful, are excluded to make way for more florid productions."

2. The lack of all this makes the R.A. fail in much of its interest and value in the eyes of those who know and appreciate design, and who can value architecture on its real merits."

3. I think plans, especially sections, to a good scale, should have every opportunity afforded them in preference to many of the mere 'perspectives,' which are often of no practical value whatever from the lack of one or other of these. . . . The greater introduction of designs for stained glass and 'instruments,' of late years, has been of great value and interest, and might very well be still further developed and extended."

MR. A. HART.

"With regard to the question of geometrical drawings instead of pictorial representations, it is not at all my opinion that the former should have more prominence than the latter, as I maintain it is certainly possible to show quite accurately a design in a perspective form; it is, moreover, far more truthful, if correctly done, to the uninitiated (for whom the Academy is intended), and very much simpler to understand. Surely this English manner of illustrating architecture is by far the most satisfactory, since for the ordinary public it is the only way by which the design may be expressed. There is, of course, plenty of room for improvement in draughtsmanship and artistic representation, but I maintain it is the correct method for us as architects to adopt, especially when we exhibit to the ordinary public."

MR. C. E. MALLOW.

"To my mind, the ideal way to illustrate architecture there would be by means of models, such as Mr. Prior shows this year, with explanatory plans and sections. Next to that, I consider pictorial illustrations, drawn by artists and further illustrated by plan and sections, in the same frame, but not in the picture itself. . . .

Mr. Wilson's water-colours of the Church at Boscombe would have been the perfection of architectural illustration, in my opinion, if plans and sections had been added in a lower panel of each frame."

I am afraid I do not agree with geometrical elevations merely, unless they are shown in the French manner, with the shadows, &c., projected, so that an idea can be formed of the amount of relief and light and shade, &c., the architect intends in his design. Otherwise, pure line drawings seem to me to be valueless as interpretation of architecture, and certainly are not understood by the average visitor at the R.A., to whom, I think, the Architectural Room might and could be made as attractive as the Painting Galleries."

MR. ALEXANDER M'GIBBON.

"Without complaining overmuch of the present measure of regard shown to drawings of architecture perhaps we should claim: More ample accommodation—the withdrawal of irksome regulations as to glass, gilt frames, &c.—the creation of a jury of selection and Hanging Committee, composed, say, half of Academicians, the remainder of members of the Royal Institute and the Architectural Association."

These granted, it would remain with architects to justify the changes by making the annual exhibition more educative to public and profession alike by more faithfully illustrating current design, including such designs as are carried into execution; for if the display could, by architects, be confidently pointed to as containing models for public approval, in contradistinction to the vulgar types in vogue, something, indeed, would be gained. . . .

Geometric drawings might well share in the current favour accorded to perspectives, for with shadows projected difference of plane is almost as well realised. I imagine, however, that these in time would become just as much the work of the specialist draughtsman. As for models, unless in such case as a theatre section with twisted galleries, or the like, I can in no particular see their utility."

MR. ARNOLD MITCHELL.

"All who are, or have been at any time, constant visitors to the Architectural Room of the Royal Academy (these cannot be a very large class) must come to the conclusion that in so far as the general public is concerned, little or no interest is manifested in the shows. This fact must, I think, be accepted by architects; and I would go even further, and express the opinion that it is idle to try and compel attention to what in itself is not of interest to the lay mind. It is all very well to talk and write about educating the public. In the first place, the public do not apparently wish to be educated in such matters; and, in the second place, it seems to me that a show of architectural drawings is about the worst means that could be devised for attracting those whose interest we desire to gain."

Architectural drawings are at best very poor things, and it is hardly to be wondered at that interest—which a fine building might possibly arouse—is not aroused when the representation only is presented. A picture is the end and object of the artist; an architectural drawing is nothing, and can be nothing compared with the ultimate object of the architects' work; and it is this ultimate result which must be placed before and brought home to the outsider before we can hope that any appreciation that is real and genuine can be evoked. . . .

The models shown at the Royal Academy this year are certainly a step in the direction of making the Architectural Room more popular, and I venture to think that photographs of executed buildings would be of even greater value in this direction. . . . If greater encouragement were given to elevational drawings, it does not seem to me that thereby the exhibition would be popularised; no doubt it would be most welcome to architects, but architects form a very small proportion of Royal Academy visitors, and the change would probably make the gallery even emptier than ever."

From the large number of inferior drawings that are hung each year the conclusion is a fair one that but few good ones are submitted, and this seems to point in the direction that sufficient space is now provided."

MR. ERNEST NEWTON.

"I do not think that the present representation of architecture at the R.A. is entirely satisfactory. At the same time, I don't think that any architectural exhibition can be satisfactory. The building, and the building alone, is the architect's work."

Personally, I doubt if geometrical elevations are particularly enlightening, as everything is shown on one plane. Plans should, I think, always accompany drawings."

I think, too, that photographs of buildings should be allowed; of course, they are not often flattering to the building, but they are, at any rate, more honest than the "perspective" we know so well. The clever draughtsman can so cook and get rid of the awkward pieces, that, in the end, the drawing bears but little relation to the building: one knows of many instances in which the whole proportion of the original building is altered and improved by the tricks of the draughtsman."

Well-made models, showing colour and texture,

fairly represent the building, perhaps; but then the landscape is lacking, and that often determines the character of the house.

Then, certainly, architects should have greater representation on the Selection Committee: painters are not very sympathetic judges of architectural drawings or photographs.

Seriously, I am inclined to think that it would be best if there were no Architectural Room at all, but then the absence of architecture would be taken as an acceptance of the fact that architecture is a business, and has nothing to do with art."

MR. A. N. PRENTICE.

"Architects, in order to convey a correct and intelligent representation of their buildings, ought to be allowed to show plans and sections of their works as separate exhibits, which should be hung in groups, and not, as is usual, with a little plan placed in the corner of a perspective view. I am not at all of the opinion that perspective views should become secondary to the geometrical drawings, although I consider the usual mode of making pen-and-ink perspectives (generally to a scale less than one-eighth of an inch) to be of very little value. Why not draw our perspectives to a much larger scale, say not less than $\frac{1}{4}$ in., and employ the brush for working up an effect. In this way any defect of detail or construction would be more readily observed. If plans and details of the same building, drawn to a large scale, were admitted to the Academy, the architect would be, no doubt, put to a considerable outlay in specially preparing them, but why should his pupils not be taught to make large coloured drawings after the Paris manner? Nothing could be more charming than the interesting manner in which M. Chedanne's drawings of the Parthenon were prepared. Why not also have enlarged photograph views of buildings? . . . But to carry out all these reforms it is plain we must have more exhibition space, and the Architectural Room should be one that is passed through by the public leading to galleries beyond, and not, as at present, forming a kind of *cul-de-sac*."

MR. E. S. PRIOR.

"As amusement the pictures and the sculptures seem to go down with the public, but the architectural exhibit does not. Why should it? What shown is not genuine work of the architect, but is only a ridiculous advertisement of it. Everybody knows this, and people do not go out their way to read stupid advertisements! . . . The painters and sculptors show their real work, with a seal upon it of personal authenticity, which would be an insult to question; but as an architectural exhibitor how often have I been asked by my brother architects if I did what I show myself? They know that it is mostly sham performances that the Architectural Room exhibits. What is so well understood among ourselves is, of course, appreciated by the public, and they show a wise discrimination in refusing to be interested. . . .

It is possible that the exhibitions of the actual working drawings made and signed by the architect himself, and accompanied by a photograph of the work produced from them, might allow the public to get interested in the personality of the exhibitor; but I fear that into this, too, would creep the old insincerities, and the whole thing be as much discredited as ever.

In my opinion the Royal Academy should confine its architecture to the platform of its other exhibits—admit only architectural representations (1) which are pictures in themselves, and, made to that end, can be exhibited as such with the paintings and drawings; or (2) which are modelled and can stand on the same basis as the sculptor's models, as the work of the artist himself."

MR. LACY W. RIDGE.

"I know of no representation of architecture at the Royal Academy. There is a room of architectural drawings, which I note, with regret without surprise, does not interest the public.

I regard the exhibition of architectural designs in competition with the finished works of painters and sculptors as detrimental to architecture, firstly, prejudicing it in the eyes of the public, and next in encouraging an over-estimation of architectural drawing as such, a danger against which William Burgess warned students in his day. One seldom sees a building which is quite up to what the Academy drawing suggested.

* We cannot print this without a protest. We think it very uncharitable remark. In a sense all exhibits are advertisements, and we do not see why the term is to apply to architectural designs more than to any others, or to things more than to models.—ED.

I think elevations, plans, and sections would be deeply uninteresting to the public.

My impression is that if the Royal Academy cares to do much for architecture it should stop the present exhibition and promote an architectural exhibition, apart from a picture-show, though not necessarily from sculpture. In this architectural drawings (including artistic geometrical drawings) of new, proposed, and old work should be shown, as well as carving, decoration, glass, and other accessory arts. Those who paid their shillings might be few, but they would be interested in architecture and the formative arts, as apart from the distinct and, in some sense, opposed imitative arts."

MR. W. F. SALMON.

"I have thought that for many years the exhibition of architecture at the Royal Academy has been unsatisfactory, and I shall be glad if something can be done to make the exhibition a more worthy and useful one. With reference to your suggestion that more prominence should be given to geometrical drawings, I would say that each architect ought to be left to illustrate his own work in his own way. I have always thought that photographs should be admitted, and that the restriction against all but gold frames should not apply to architectural drawings. In our Glasgow Fine Art Institute a committee of architects (not all members of the Institute) have the control of the architectural section, and this plan works very well, except that here we are very much restricted for space.

I would suggest that a representative committee of architects should be appointed to control the yearly exhibition at the Academy, and that a much larger room should be devoted to it."

MESSRS. BAILLIE SCOTT & SETON MORRIS.

"Although there appears to be a feeling of dissatisfaction amongst architects as to the limited accommodation afforded to architectural drawings at the Academy, it is difficult to advance any definite criticism unless we are assured that the limitations of the space at present afforded involves the rejection of any appreciable amount of really meritorious work.

With regard to the question of the desirability of giving more prominence to geometrical designs, although these would undoubtedly be more interesting to architects in an exhibition which is presumably primarily intended for the general public, it is probable that technical drawings would prove even less attractive than the perspective view. The geometrical elevation is, after all, merely a means to an end, and, apart from technical interest, is of very little value in expressing the really fundamental qualities of a building. It may be even said to be misleading, because it does not in any way suggest the paramount importance of the masses or the point of view, and leads one to imagine that architecture is more concerned with flat surfaces than with solids.

If the object of the drawings exhibited may be assumed to suggest to the general public the actual appearance of the completed building, the perspective view certainly seems to be the most desirable if it is honestly executed and does not suggest qualities which do not appear in the actual building. It is also to be wished that more individuality and variety should be given to the drawings by giving the preference to those which are the work of the architect of the building.

The introduction of models for the first time this year appears to be a step in the right direction, because they give the real masses and grouping of a building from every point of view."

MR. H. D. SEARLES-WOOD.

"I am of the opinion that the Architectural Room at the Royal Academy does not adequately represent the architecture of the year, and that as at present arranged it is not satisfactory.

I am in favour of the admission of geometrical illustrations of architectural designs in place of perspectives."

MR. E. SEWARD.

"Architectural perspectives alone do not duly represent current architectural work. . . .

I have long considered that a really interesting annual exhibition could be got together by a combination of interests in which—at least—the Royal Institute of British Architects, the Architectural Association, and the Royal Academy could be represented. Whether this exhibition might be continued in the present Academy room (with some proper and adequate addition) would be a further question. Instead of merely gold-framed drawings, with black and

white, colour and monotone jumbled together; sketches of old work of ideal notions—competition or otherwise—and dashy perspectives of unexecuted work thrusting more staid elevations of actual buildings off the line. A yearly show, attractive and educational to the profession and the general public alike, could be got together with little difficulty.

There are circumstances and stages of work in connexion with most buildings of importance which would go to show much of the real interest and responsibility of the architect's work.

Most architects could show a frame of first ideas, with sufficient indications of their later development and progress. . . .

Such an exhibition could not fail to interest the public more deeply in our profession.

A further feature would soon be reached in the more general use of architectural modelling, an almost neglected art in England, but one which must go very far towards solidifying and improving architectural design, especially if carried out in a less flimsy and unsubstantial material than cardboard. To follow the development of architectural designing further, the first and later models for art ironwork, stone-carving, mosaic decoration, &c., together with accessory arts like stained glass and mural decoration, would all have their due place."

MR. LARNER SUGDEN.

"I do not consider the present representation of architecture at the R.A. satisfactory. The selection appears to be negligent or arbitrary, or both. . . . If more space could be found it would probably be consumed by perspectives now rejected, though good plans and elevations would prove infinitely more interesting to those for whom the show ought to be intended than this method."

MR. C. J. TAIT.

"Architectural excellence does not consist in draughtmanship; such a faculty is merely a valued instrument in the hands of the designer; and if it be true that a good picture is known by what it omits rather than by what it embraces, the tendency of these drawings, admirable though they be in their own way, is to become correspondingly less explanatory to those who seriously desire to discover the intention of the designer. The Academic style—in painting, at least, and it is pre-eminently an Academy of Painting—has always been regulated by deference to public opinion rather than inspired by a desire to direct it. But no public that I am acquainted with has been ever moved to an intelligible utterance upon architecture, and less upon architectural drawing, so that its interests are not involved in the present question. The size or age of an actual building, bearing, perhaps, upon its face the records of history, appeal to obvious human instincts, but delineation, as a graphic art which is not imitative, finds the average imagination unresponsive.

Hence an exhibition of architectural drawing directed toward the encouragement of architecture has only those engaged in its performance to whom it can appeal, and such a one is concerned with, not whether a drawing be a pretty picture, but with whether it is explicit.

One may ask, Can any drawing, while remaining true to itself, adequately represent a creation conceived in brick or stone may be, but certainly not in lead-pencil? . . . I would answer that it may, but expressed in the symbolic [language] of working drawings—a language that those who run may read, but a vehicle only, and not an end in itself. Therefore I would advocate the abolition of perspectives, whether drawn by the architect or not, unless such a drawing be on a footing with other working drawings—namely, as an essay in projections and sky-lines—and give my unqualified approval to the admission of plans, sections, and elevations. This would include a demand for further space being conceded, partly owing to the increased number of drawings necessary to adequately explain one building, but also that these drawings should be drawn to as large a scale as possible, that they may express themselves boldly by colour as well as by line.

This work, I maintain, need for no reason fall upon the actual designer, except upon the assumption that he can do a thing better himself than he can get others to do it for him. It is purely documentary clerk's work, and we are in no way concerned with how proficient a designer may be with his pencil—matter entirely one of personal convenience. In saying this much, the all-important question of STYLE in architectural drawing is in no way touched upon. I insist only that picture-maker and architect are two persons, no to be confounded."

MR. SYDNEY VACHER.

"I cannot think anyone is satisfied with the way architecture is represented at the Royal Academy. There seems no principle on which exhibits are chosen, and the frames hung seem to be picked out more to give a pretty effect on the walls than to exhibit the best work sent in.

For years the Academicians on the Hanging Committee seem to have arranged the exhibits of architecture with a view to attract the masses, instead of trying to make it representative of the work of the day, and useful to those who take an interest in the art of architecture. . . .

To make exhibits of architecture satisfactory at the Academy, they should, as near as possible, be similar to the illustrations that are put before clients every day by professional men; by that means they would teach and be instructive.

I should consider no exhibit satisfactory unless it gave geometrical elevation and plan, as well as perspective or a photograph of the building executed. I would not advocate large detail drawings, as I think it much wiser to concentrate exhibits; therefore I would say such drawings should be photographed, and a liberal sprinkling of diagrams of the human figure put over them, so that the scale can be seen at once. This is the system the late Mr. Burgess employed. . . .

Drawings of stained glass and decorative work should be placed among the painters' work, or all together adjoining the Architectural Room. I think, considering the number of architects who do good architecture compared with the number of painters and sculptors who do good work in their respective branches, the architects cannot complain against the smallness of the space allotted to them."

MR. A. NEEDHAM WILSON.

"The manner in which English architecture is treated by the Royal Academy is indicative of the general indifference to the art in this country. We certainly compare unfavourably with the French nation in their esteem for architecture, an esteem which is fostered not only at the Salon, but in every other way.

I therefore most certainly hold that the present representation of architecture at the Royal Academy exhibitions is unsatisfactory, and I would like to see—More space allotted; a system of classification into Church, Domestic, Public Building, Sketches, &c.; a lower limit to the number of drawings sent in by each person; a more exclusive control by architects in the selection of works; and lastly, as you suggest, more prominence to geometrical drawings."

MR. THOMAS WORTHINGTON.

"I have always thought the French method of illustrating architecture the true method, and our own showy perspective drawings, so generally prepared by mere experts, as of very little value. I have seen drawings in the Trocadéro Galleries, elevations, plans, and sections which produce a totally different effect on my mind to the pretty drawings which form so large a proportion of the works hung in our own Architectural Room."

An exhibition of photographs from actual executed works would, I think, be of much more use than competition perspectives and drawings of that class which form so large a proportion of the works seen at the Academy."

Mr. H. L. Florence, who says that we may quote his opinion but not print his words *verbatim*, observes that an undue prominence is given in the Architectural Room to drawings "of an unreal nature," i.e., cleverly drawn designs for buildings never intended to be carried out; that too often drawings are well hung merely because they are good pieces of draughtsman's work, though the design is below the average; and that if more prominence were given to geometrical drawings of architectural designs, the exhibition would be of more practical use, and the architect's own handwork would be more generally seen.

Mr. Honeyman also sends a letter with a request to quote his opinions generally rather than *verbatim*. He thinks there is a want of any obvious principle in selecting and hanging drawings, and that the rule should be, that only drawings of buildings which have been executed should be admitted. As it is well known that the best and most successful architects have little direct interest in exhibiting, he thinks they might be invited to exhibit. He considers that there is only one means of exhibiting architecture in a room, viz., by photographs, which the Royal Academy regulations forbid. If the Royal Academy wish to encourage architecture, Mr. Honeyman thinks that they must give some representation of what has been done each year by means of photographs.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS:

ANNUAL MEETING.*

Sewage Farm Management.

The following paper, written by Lieut.-Col. A. S. Jones, V.C., Assoc. M. Inst. C.E., on sewage farm management, was next taken. He said the members of the Association might, with justice, plead that their pressing duties in many other directions made it impossible for them to influence individually the management of a special technical act carried on in the country by a shifting committee of their Sanitary Authority. But they could not shut their eyes to the sanitary and financial mistakes which were now common in many parts of the country, and it might be possible for the Association to act collectively for the information and guidance of all who were responsible in such matters. When they began to realise the fact that land and plant life were the only purifiers of town sewage, it was thought that the supply of educated labour would not fail for the right disposal of sewage, and that it only remained for the engineer to convey the sewage to a level or evenly sloping surface outside the town laid out with carriers, and to leave an ordinary farm bailiff to distribute the liquid at discretion. The consequence had often been that this inexperienced farmer had tried to grow crops in the ordinary manner, and let his sewage as much alone as the committee would allow, with the result that this body came to the conclusion that he was sacrificing the purification of sewage to the interest of his crops, and ordered him to turn his sewage here and there with regard to growing crops; and a sewage marsh discredited the whole principle of sewage farming. Public opinion revolted from the subject, and opened a willing ear to any new inventor who promised to put the difficulty out of mind by some short cut of his own, the latest dodge being always the most popular, although a quarter of a century's experience of hundreds of patents left the Native Guano Company's practice more successful than any of its rivals in the only result attainable without land, i.e., clarification. Success of this kind, moreover, was also a question of educated labour, and the old-established company at Kingston-on-Thames were happy in the possession of a staff of men who, by long practice, could perform the scavenger sort of work necessary to effect separation of the sludge, and to turn the clarified effluent into a tidal river, with the requisite cleanliness of work to satisfy visitors on a show-day, and to earn the company's subsidy. In the same way, with organised labour in scraping solids from iron gratings to burn by destructors, and transporting wet sludge in tank-steamers to the Nore, a system had been established by Mr. Crimp, C.E., and Mr. Dibdin, chemist to the London County Council, which had materially reduced the nuisance formerly created by the discharge of crude sewage at Barking and Crossness. It seemed remarkable that the limited work of clarification should have interest enough to attract the thought and attention required to attain such results, but should interest no one where the question of purification was concerned and thought and attention were required in a much higher degree. There were exceptions, of course, like Birmingham, Nottingham, and Wimbledon, where really skilled managers were supported by wealthy Corporations, and carried out the work of purification satisfactorily, though hampered by too large a proportion of sewage to acreage; but on smaller farms, with more favourable conditions as to area, false economy, and inefficient results, both sanitary and financial, were generally admitted. It was the business of the sewage-farmer to get his crops off as fast as they grew, because the land was wanted for more sewage, which it ought never to get except in the early stages of the crop's growth. He had to bear in mind that the stream of sewage was always coming, and arrange that a sufficient area of his land should be fallow in winter or occupied in summer by young crops, in order that he might have room to spread the liquid intermittently at all times for sanitary reasons. Watchfulness on the part of the manager and his watermen was the essential quality when it was a question of sending off the best possible effluent, and those who understood their business knew that good heavy crops were the best factors in transmitting sewage into such effluent. This good economical result as rent or profit on the farm balance-sheet was, however, not attainable in the first or any given year, owing to the large labour expenses which must be incurred with the double success, and farming

committees and managers had not strength of character or fixity of tenure sufficient for reliance on the average result in rent and profit over a series of years. That had been the real bane of sewage farming in England. In numerous instances it had led to starvation in labour and the growth of ordinary bulk of crops with a bad effluent, and often to the destruction of much of the poor crops by untimely doses of sewage in emergencies which had not been foreseen, as well as to nuisance from stagnant sewage and foul effluent. This mode of sewage farming had been introduced all over the country, without a model farm or any provision for the technical education of managers. It seemed strange that so many millions of borrowed capital should have been expended on sewage farms after public inquiries in all parts of the country, and no further questions asked by the Local Government Board or other Authority as to the working of these farms during the last twenty years; but such was the fact, if they excepted the action of the Royal Agricultural Society of England in 1879 into the working of a limited number of sewage farms. He could count on his fingers the self-educated sewage-farm managers who did justice to their charge, and he consequently suggested technical education at model sewage farms for managers and watermen, where a register of qualified persons could be maintained. But the first and all-important measure for improving sewage-farm management was to enlighten the public as to existing evils, and to excite general interest in their abatement; and it occurred to him that a deputation from their Association, jointly with members of the Institution of Civil Engineers, to wait upon some member of the Government might have a good effect in drawing attention to the matter. While writing that paper he was called upon by the War Department to undertake the management and reform of their camp-farm at Aldershot, which had fallen into great disrepair of late years. This was a compliment which he would have accepted more warmly if it had been offered some five years ago, when he was shaking off his old harness at Wokingham, and when the state of things at Aldershot had not reached the present low ebb. But he knew this camp-farm in its prosperous days, under the management of Mr. James Blackburn, and after preaching as he had been doing lately he could hardly refuse this call to assist in restoring its credit if possible. The emergency was very pressing, for the War Department had given notice to their tenant to quit on the 20th inst. (June), and their new manager would take over its charge on that date with no light heart, but with the earnest hope that, in spite of old age, he might yet be able to do something more to prove in practice the sanitary and economical advantages of distributing town-sewage over suitable land.

The meeting of the paper being proceeded with on Friday morning, when

Mr. R. Godfrey (King's Norton) said he had taken particular pains to look through the point mentioned by Colonel Jones in his paper, viz., the education and training of sewage farm managers. He thought it would be advantageous to the Association to consider whether, in these days of technical education and scientific knowledge, there should be some form of technical instruction for sewage farm managers. A man might be a very good agriculturist and yet be completely beaten when put upon a sewage farm.

The President proposed a vote of thanks to Colonel Jones for his paper, and expressed regret that he was not present to support the views which he had put forward.

Mr. White (Oxford), who seconded, remarked that there was no doubt Colonel Jones had hit upon a very bad blot in sewage farm management. He took it they were all in favour of the views Colonel Jones enunciated.

The vote of thanks was accorded with acclamation.

Park and Garden Architecture.

Mr. T. H. Mawson, Garden Architect, Windermere, then read a paper upon the above subject. He said that garden-making has been said to be the only art in which the realisation surpasses in beauty the original conception. However this may be, it is true that unlooked-for suggestions and combinations of beauty arise at every stage of the work, each year's growth bringing new revelations of charming groupings of foliage. Considering the immense possibilities open to those who undertake to lay out parks and gardens, very little, if any, advance has been made in the art of garden and park-making, and influenced by the low ideals of the early Georgian period, men ran after what they considered a new discovery, which

* Concluded from last week.

was briefly, that every bit of pastoral scenery was of itself a garden fair. Thus we find that, for the future, imitation took the place of exalted idealisation, the crudest forms in nature being placed upon a higher pedestal than the sweetest forms repurified by man's imagination. That some corrective to the vagaries into which the old school had fallen was required is indeed true, but such a radical change as that brought about by the landscape gardeners of the latter part of last and the beginning of this century is to be deplored. Many of these were men whose abilities were measured by the amount of deception they were able to perpetrate. With such ideals it is not surprising that sham castellated ruins and other absurd excrescences came to be considered as necessary adjuncts to garden scenery.

It was during this depraved period that public gardens and parks began to be more generally recognised as a public need, and, taken as a whole, the parks then made show how low art had fallen. Emancipation from these mischievous methods may be slow, but improvement in some direction is now called for; it is, in fact, necessary to make parks and gardens more worthy of the name, by introducing more of the method and spirit pursued in the days when the best English art work was produced. In a park or garden, invention and intention should once more be made apparent; and it should be a place where the wealth that produced it should not be altogether lost sight of; its beauty and ornamentation should be according to man's conception and forethought.

Of course, the requirements of the public park to-day are not the same as those which had to be incorporated in the old gardens, but the spirit which actuated these old designers might be imported into the modern work, and so make our parks in some reasonable degree on a level with our boasted modern art culture.

To attain to the excellence of this old work it is necessary that everything, small or great, be designed in harmony; that everything, whether building, planting trees, shrubs, expanse of water, grass lawns, &c., be designed or planned with due consideration to its fitness, proportion, and balance, without incongruity or discord. To attain this completeness and unity of the whole implies that to a knowledge of architecture, the chief essential, must be added a study of the techniques of good gardening and of arboriculture.

The true park must, like most other inventions, rest on the foundation of good planning, worked according to whatever characteristic is to have predominance, whether seclusion or recreation, or an equal combination of both. On level ground it is comparatively easy to shut off the various recreation-grounds into proper compartments, the eye never being high enough to obtain a panoramic view, but in dealing with a site with considerably varying levels much would depend upon the disposal of these features. The trampled grass of the cricket-crease, the cinder-path of the cycling-course, and the excited noise of the footballers, are disturbing elements which require careful handling, but, as a rule, everything which is calculated to induce physical recreation should receive careful attention. The requirements of the surrounding population would, of course, decide what to go in for, but the following are specially worthy of consideration:—Lake for boating and bathing-ponds; children's playground; cycling-tracks; football-grounds; cricket-creases, bowling-grounds; archery-courts; quoit-grounds; gymnasiums for both sexes; tennis-lawns.

Mr. Mawson gave alternate designs which he had prepared for the laying out of the East End Park, Wolverhampton, which he regards as a good specimen of a typical site for a modern park, well calculated to suit the requirements of the surrounding population. Although too much stress, he said, cannot be laid upon the planning or framework of the public park, to clothe and adorn with beauty each respective part, and still preserve the unity of the whole through all details with thorough completeness is "a taste's important task." To accomplish this in any degree worthy of the end in view, we must study and idealise nature.

It is not purposed to condemn entirely landscape gardening as at present practised, but to advocate more the judicious selection and association of the forms of nature, and to dispose them according to artistic conception; this is quite another thing to slavishly copying nature. Here the whole skill of the nature lover finds pleasure in turning her weakness into strength and her crudeness into grace. Then there is the touching-up of nature, or helping nature to speak the truth. This is a phase of park designing which always requires careful thought, as

nearly every site possesses different natural features.

There may be cases in which the foregoing touching-up principle is the only possible one to adopt, but even here it is to a great extent possible to keep clear of the make-believes which characterise some park-makers' work. Take a case in point, say a piece of land, 60 acres in extent, mostly old pastures and meadows divided by hedgerows in which there are a few old trees, the land for the most part of very undulating character, a stream running through the ground, the soil fairly good, ranging from black to brown loam, lying on marly clay; the ground largely surrounded by factories and coalpits, the atmosphere for a town fairly clear. The requirements are—1, Lodge and two main entrances, and two foot entrances; 2, lake as large as possible for boating; 3, cricket-ground; 4, Tennis-lawns and bowling-grounds; 5, main drive; 6, ample walks and roads for promenading. The sum to be expended, 6,000*l.*, inclusive of keeper's lodge and boundary fence. The total sum to maintain annually not to exceed 500*l.*, half of which is to be supplied out of the rates, the remainder to be raised in revenues from the park in boat-hire, &c.

A safe estimate for the erection of the park-keeper's lodge and entrance, with the additional entrance, would be 1,000*l.*; the fencing would probably not be less than 1,000*l.*, and the two smaller entrances 250*l.*, leaving 3,750*l.* to expend upon laying out the park.

One of the most important things in the laying out of a park of this description, especially in a populous neighbourhood, is to obtain as large a lake as possible. It would require an area of not less than 12,000 yards super of gravel walks and spaces, which estimated at 2*s.* 6*d.* per yard, exclusive of excavation, would cost not less than 1,500*l.* Then there is the cricket crease. If more than one site suggest themselves, select the one nearest the boundary road, so as to allow of a separate entrance. The same should be done in respect to the children's playground, but choosing the most populous side of the park. Tennis lawns and bowling greens can be located anywhere, as they are not disturbing elements in any park.

The main drive should have something of directness about it, and not be less than 20 ft. in width. To the east, or from whichever quarter the winds of the district were most prevalent, the planting should be dense, preferably of Scotch fir, if it would grow. The side bounded by factories and mines would require tall growing trees to block out these surroundings and give an aspect of quietude to the Park. At other places, where the traffic was likely to be great, the sides of the hills would be planted with masses of native trees, such as beech, elm, sycamore, chestnut, cherry, crab, thorn, with undergrowth of common holly, yew, elder, dogwood, mahonia, and privet. In the dells groups of rhododendrons might be introduced. The lake margin would be planted at intervals with masses of silver-leaved and other willows, alders, &c. If after this there was 400*l.* or 500*l.* to spare, it could be expended on a simply-designed erection placed at a point convenient to the lake and drive, and towards the centre of the park if possible. This could serve the purpose of refreshment-room, rain-shelter, cloak-room, with conveniences. If possible to fill the other conditions, the building might be placed on the edge of the lake and serve also as a boat-house.

In such a park as the one just described, everything of a cast-iron or tin tabernacle nature should be avoided. There would be no bedding-out or display of foreign shrubs of the monkey-puzzle order, nor would there be any notices warning people to keep off the grass; every pleasing natural feature would be retained, but its picturesque enhanced wherever possible, and everything unsightly blocked out and hidden.

In the foregoing we have the two ideas which are possible without violating the canons of good taste; "the first is made up purpose to please," the second is nature's work adapted to the requirements of man with as little interference as possible.

Mr. Mawson next described the landscape park, of which he cites as an example Hanley Park. This is a park of some eighty acres in extent. Very little of the ground was in its natural state, being partly covered by pits, mounds, refuse for ironworks, brickfields, and potteries. None of the land was pastured, a lake had to be made, a pavilion provided, and also ample terraces for promenading. Mr. Mawson suggested that small gardens and open spaces should invariably be treated in an architectural and

formal manner, quietness of style should be their chief characteristic.

In small parks of five to ten acres, fountains and architecturally treated ponds may often be worked in with good effect. A wealth of flowers arranged in formal beds is always appreciated in small parks. Lawn-tennis courts and bowling-grounds, within quaintly clipped hedges, always look well. Colonnades, patterers, avenues of pollarded limes, give grateful shade. All walks should be broad, especially on terraces, never less than 10 ft. on a terrace, and promenade walks never less than 20 ft. Shelters and band-stands should be specially designed to harmonise with other features in the park; high keeping and primness should always be associated with small parks.

As a rule, parks and gardens of ten to twenty acres should not be cut up by drives, especially if in a district with a large working-class population.

Fine broad avenues are always appreciated. For this purpose limes, planes, elms, beech, or sycamore, are the best. The width of an avenue should never be less than 45 ft., and the trees should never be planted closer than 35 ft. apart. Of the things to specially avoid Mr. Mawson enumerated unreality and pretence in design; narrow walks and drives; the arrangement of football grounds in the centre of a park, unless of considerable size; all appearances of jerry in construction and veneer in ornament; bad drainage; narrow belts in planting; small, specky plantations, &c.

Most of the foregoing suggestions have been urged time and again by the writer when dealing with Parks Committees or Corporations, but in reply it has very generally been stated that the views here expressed show too great a confidence in the art perception and good feeling of those who generally patronise public parks, such replies being very often backed up by numerous instances of destruction, especially of verges and lawns, and in other cases of trees and flowers. So firmly have some Committees been impressed with this idea that it has led to all sorts of bad arrangements in parks with which the writer has had to do. At Wolverhampton, for instance, a walk is to follow the margin of the lake, because of a fear lest any turf or plantations which ran down to the water's edge should be destroyed. After considerable study of the subject, the writer has come to the conclusion that the public value most things in proportion to the amount of earnest work put into them by the designer and craftsmen working under him. Where destruction takes place it is very often, "though not, of course, always," because the thing destroyed had little right to exist, or otherwise because the planning was so bad that destruction was but the natural sequence.

Trade Effluents.

Mr. W. Spinks, Assoc. Mem. Inst. C.E., of Leeds, Lecturer on Sanitary Engineering, Yorkshire College, Victoria University, next read a paper on "Trade Effluents." He said he did not propose to lay before them any particular methods of dealing with trade effluents *per se*, but rather to submit some considerations in those cases where they do discharge into existing sewers, or where it might be desired that they should discharge into any contemplated system of new sewers. The first point that presented itself was—what right had manufacturers to have their effluents connected with the public sewers? Many of them, by long user, had acquired a prescriptive right, but the bulk of them, no doubt, would be governed by existing legislation, which, to say the least of it, was delightfully vague. Having quoted the special clause, dealing with manufacturers' refuse, of the Rivers Pollution Act, 1876, Sec. 7, Mr. Spinks remarked that the law being as it was, they must do the best they could with the conditions that present themselves to them. First of all, they must make sure in formulating any new scheme of sewerage, what were sewers and what streams. In many places watercourses had been culverted, and to them had been connected, besides wastes for manufacturing, drains from houses. During 1894 proceedings were taken by the Mersey and Irwell Joint Committee under the powers of their Act of 1892 (ch. cxc.) against a manufacturer for polluting a stream, when it was proved in evidence that the stream was culverted, and that it received the sewage from two or more houses, and it was, therefore, held at Quarter Sessions that it was a sewer, as defined by the Public Health Act, 1875, and that the proceedings should have been instituted against the Sanitary Authority. This decision was of importance to all authorities and their engineers. The quantity



The Courtyard, Earls Hall.

of domestic sewage varied, according to the class of property in the district and the habits of the population, from ten to forty gallons per head per day, and the maximum quantity discharged at any given period of the day could be approximately ascertained, but not so the quantities of trade effluent. The magnitude of this portion of the question would be understood when they learnt that an ordinary-sized bleach or calico-printing works dispersed each working-day 500,000 gallons of effluent water. Domestic sewage was never very variable in its constitution, but it trade effluents were added there would be noticed during its flow striking changes both in its colour and in its odour, according to the kind of waste discharged from the manufactories. In places where the textile, tinctorial, and chemical trades were carried on they found sulphuric, hydrochloric, and nitric acids, alkalies, soap-les, solutions of iron, zinc, tin, alum, copper, chrome, antimony, and arsenic, waste dye liquors, spent dye wares, glue, size; dressings, lint, fleece, fibre, and waste tin solutions. In districts where hardware, iron-wire, and kindred trades were prevalent, they found the sewage holding in solution iron in considerable amount, derived from pickling iron-wire, also containing salts of iron, as ferrous chloride. Where trade effluents were discharged into the sewers it was essential, if the process of treatment was to have justice done to it, that manufacturers must treat the sanitary authorities fairly, and must discharge their effluents equally, as far as possible, and not hoard up their strongest liquor for despatch during the night or on Sundays, unless they were desirous of the authorities coming within the clutches of the River's Board, which was an experience more honoured in the breach than the observance. The question of the treatment of combined sewage was essentially one to be settled by chemists and bacteriologists, leaving the engineer to design the necessary works requisite for the process. Having quoted the experience of Nottingham, Bradford, and Nuneaton, Mr. Spinks said it seemed clear that in dealing with combined sewage the engineer would be called upon to provide ample tank accommodation, and how to determine their capacity was likely to baffle his ingenuity, owing to the difficulties, as had already been pointed out, in ascertaining the daily flow for any constant period. It was well known that, for the purposes of sewage-purification, the Local Government Board insisted that there should be, as a minimum for filtering purposes, one acre of land to every 2,000 persons, their opinion being that at present there was not a testimony sufficiently unanimous as to the efficiency of any other

system of purifying sewage. In conclusion, he said he was aware that feeling ran rather high in many districts upon the equity of levying rates upon the manufacturers for the purposes of sewerage and sewage disposal works when they were not permitted to avail themselves of such sewers and works, but were called upon to expend their own capital in providing plant for treating the effluent upon their own premises. The whole question was a very delicate one, and that was hardly the place or the time to discuss it, the parties to determine it being the communities affected, and the sanitary authorities, as engineering did not enter into this stage; but before any change could take effect it appeared clear that alterations would have to be brought about in the existing laws, both as to rating and river pollution, and this would necessarily be a very slow business in the present state of the Parliamentary workshop. There was just one other feature that must not be lost sight of, and that was the constant changes which were being brought about by new discoveries in the chemical and mechanical sciences affecting the processes carried on in the various industries, and which were all tending to lessen the obnoxiousness of the polluting effluent, and often result in discovering elements of value in the bye-products, which render their recovery simple and profitable.

Mr. C. Jones, Ealing, proposed a vote of thanks to Mr. Mawson and Mr. Spinks for their papers.

Mr. Clarkson, Tamworth, seconded the vote of thanks, which was accorded with acclamation.

Subsequently a visit was made to Messrs. Oates & Green's works—the brick-works at Hoxley Green-road—and the pipe works at Ellen Royd. Messrs. Oates & Green entertained the members to luncheon, after which the party drove to the Corporation Waterworks at Castle Carr, which were described by Mr. J. A. Paskin, C.E., the waterworks' engineer. On Saturday, June 29, the members visited the stone quarries of Messrs. Brooke & Son, the "Sillex Brand," the new markets, and other public works in Halifax.

OPEN SPACES.—The Chancellor of the Diocese of London has agreed to issue a faculty for placing the churchyard of St. Leonard's, Shoreditch, under the control of the churchwardens in so far as may be necessary for laying it out as a public garden, and so maintaining it, subject to the control of the Consistory Court. The faculty will also provide for an enlargement of the graveyard by some land to be given by the London County Council in exchange for a small portion of the graveyard which the Council seek to acquire for their new street from the church to Bethnal Green.

Illustrations.

ST. ANN'S CHURCH, WANDSWORTH.

THE original church was designed by the late Sir Robert Smirke, and opened in the year 1821. On plan it is a simple parallelogram, measuring 9 ft. by 57 ft. internally and having a deep gallery on three sides. At the east end there is a kind of elliptical bay-window, in which stands the altar, and there is a small vestry on each side of the said bay. The view shows the proposed new chancel, with a chapel on the south side, having an organ-chamber above, and vestries for the clergy and choir on the north side. The chancel is groined in plaster. The architect for the new work is Mr. Ed. W. Mountford.

FRIEZE, TOWN HALL, SHEFFIELD.

The portion of the frieze illustrated is on the left-hand side of principal entrance of the new Town Hall, Sheffield, and represents the less skilled labour of the district. On the right-hand portion will be represented the crafts and arts of Sheffield; this portion we shall probably publish in a future number.

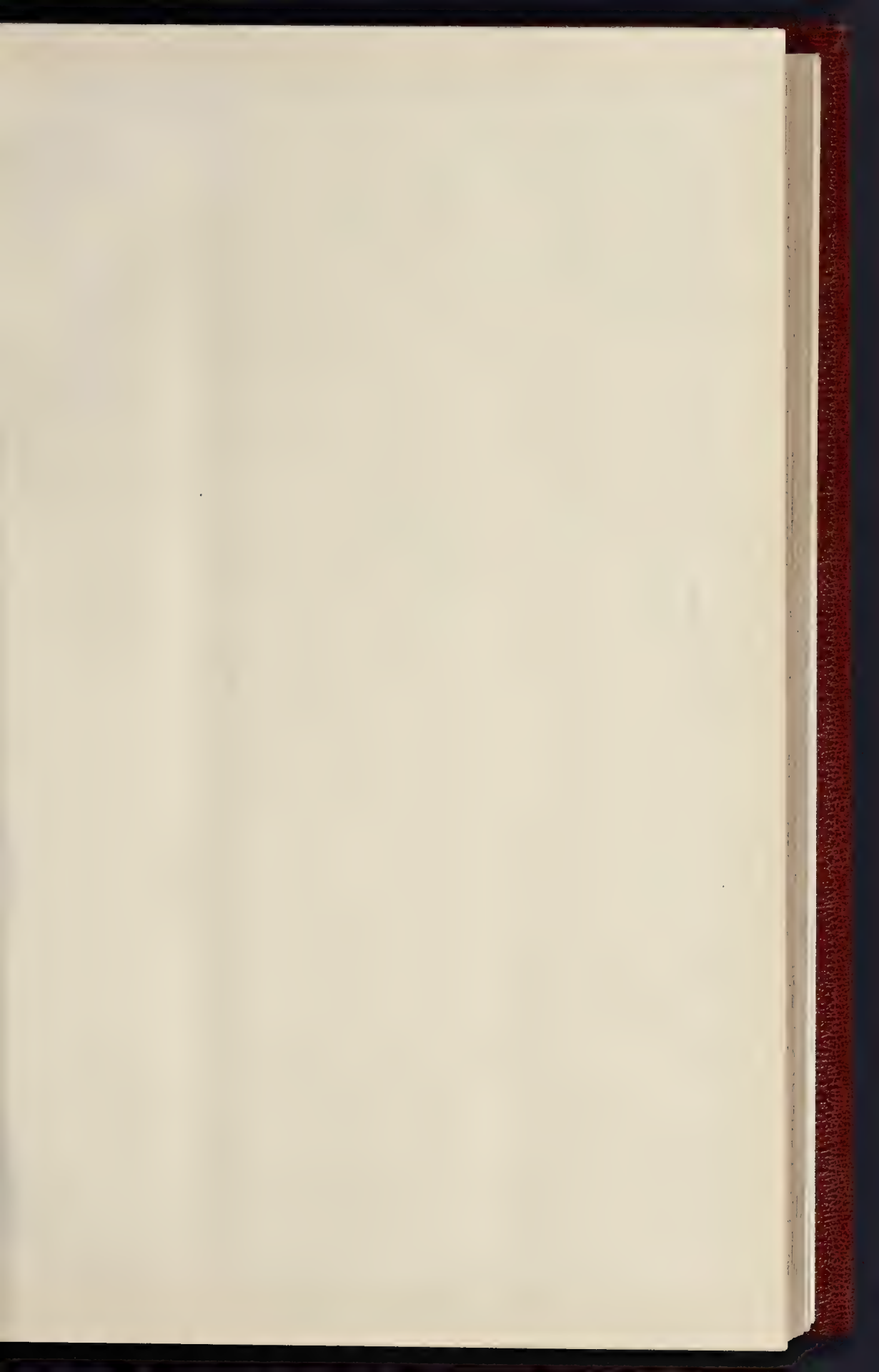
The projection of the figures varies from $2\frac{1}{2}$ in. at the top, to $1\frac{1}{2}$ in. at the feet of figures to accommodate the angle of site, as exemplified in the best Greek work, *z.*, the Parthenon frieze; and has been modelled from the front or surface plane, this, in Mr. Pomeroy's opinion, being the true plane of all glyptic art, the opposite to the building up, or back plane of plastic decoration. The entire length of the east portion of frieze is 36 ft. by 3 ft. 5 in. high.

EARLSHALL, FIFE.

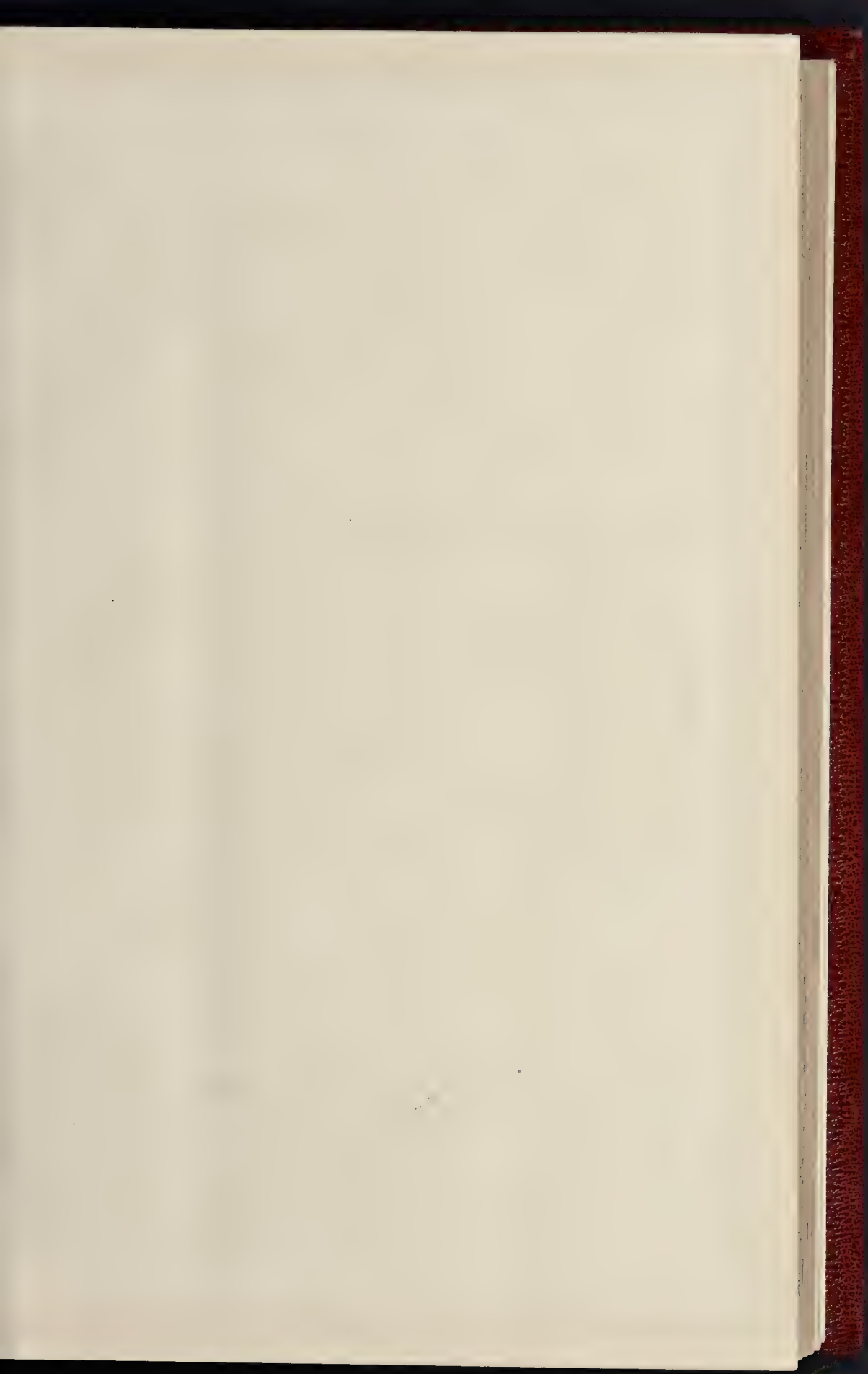
WE give a general drawing of this interesting house and its surroundings, by the architect, Mr. R. S. Lorimer, of Edinburgh, who has been engaged in restoring and adding to it, and also illustrations of the hall, and of the ceiling of one of the rooms from photographs. We also append, as engravings, a plan of the house and a view in the courtyard.

The double-page lithograph, showing the house and garden as now treated, is from a drawing at present in the Royal Academy.

The house, though not a very large one, is of considerable interest in a historical sense. The following information in regard to it is taken from a paper read by Mr. Lorimer on the occasion when the Edinburgh Architectural Association,



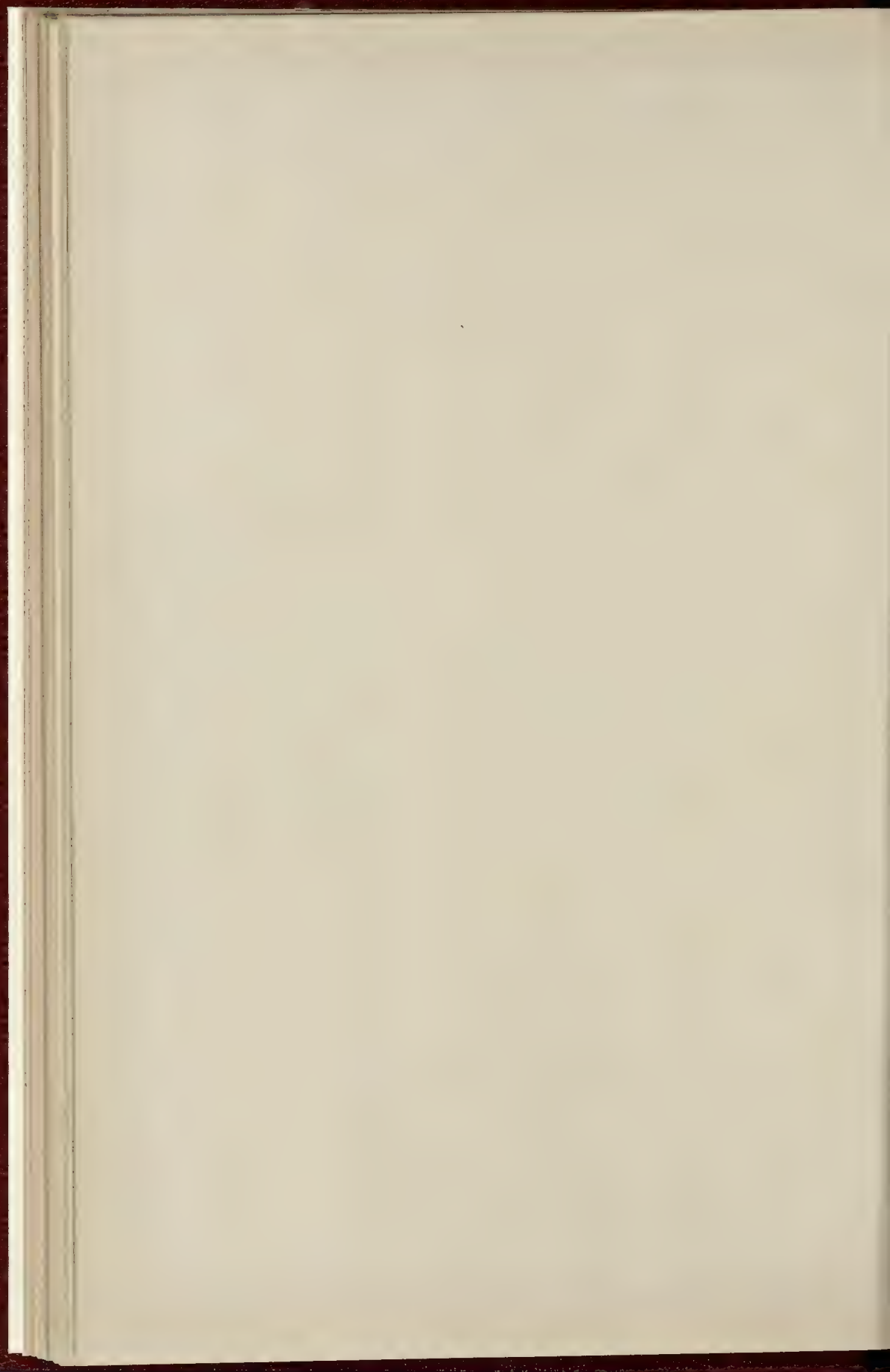




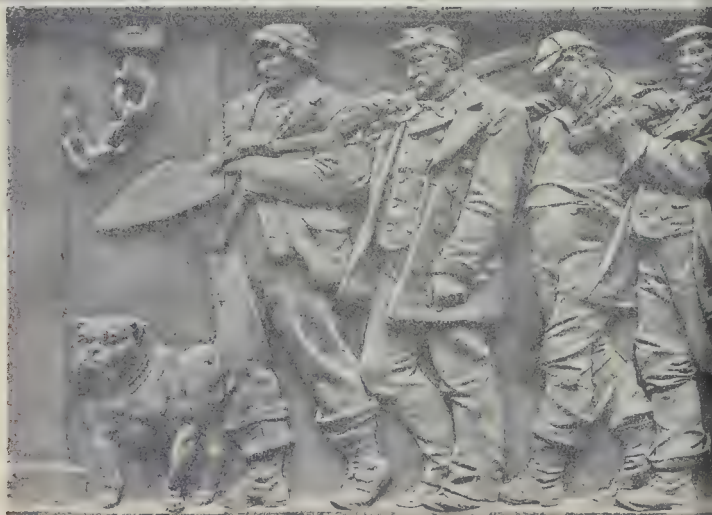
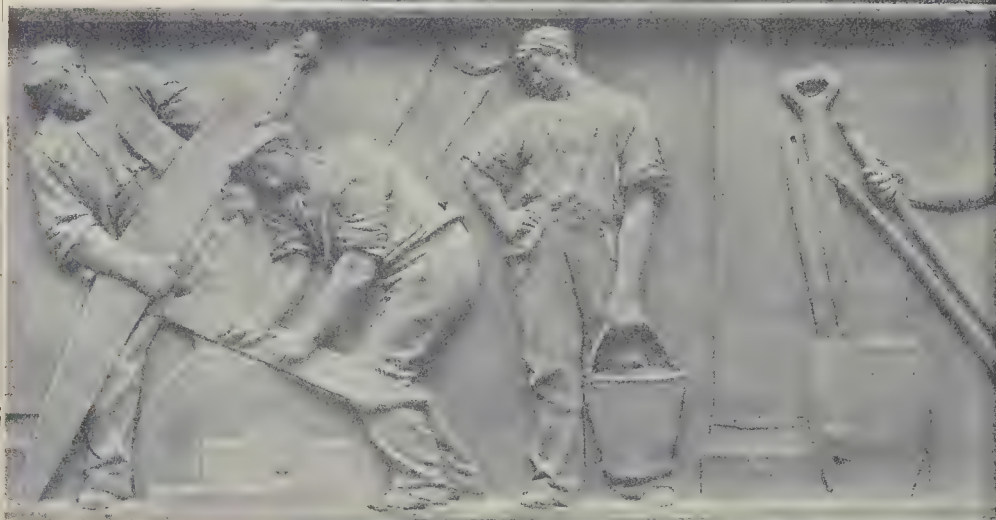


ST. ANN'S CHURCH, WANDSWORTH: ADDITION

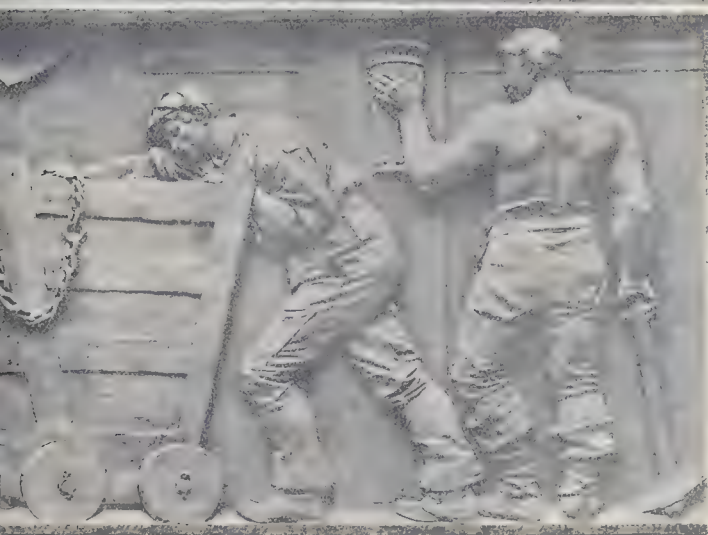


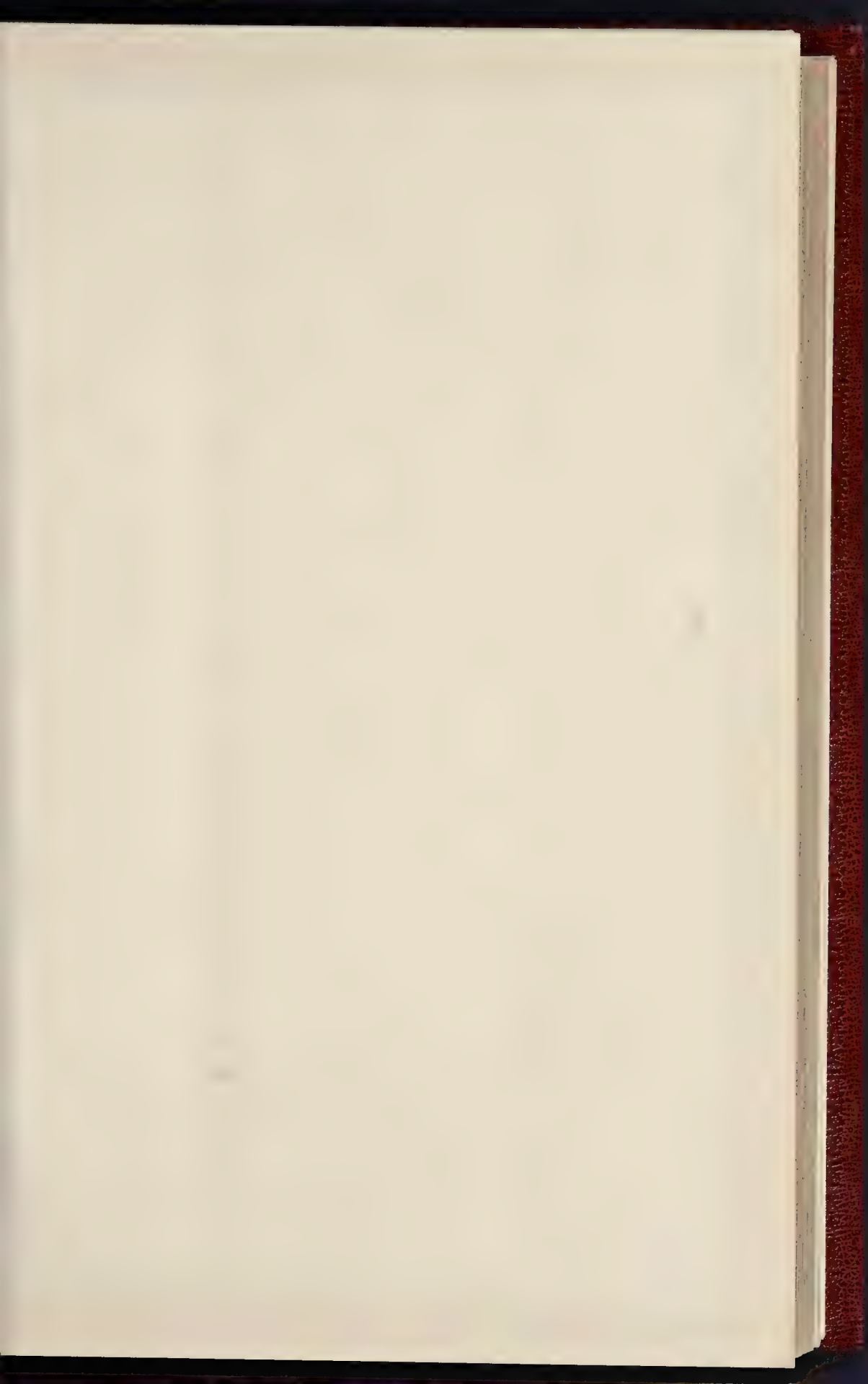






PORTION OF FRIEZE REPRESENTING 'LABOUR,' AT



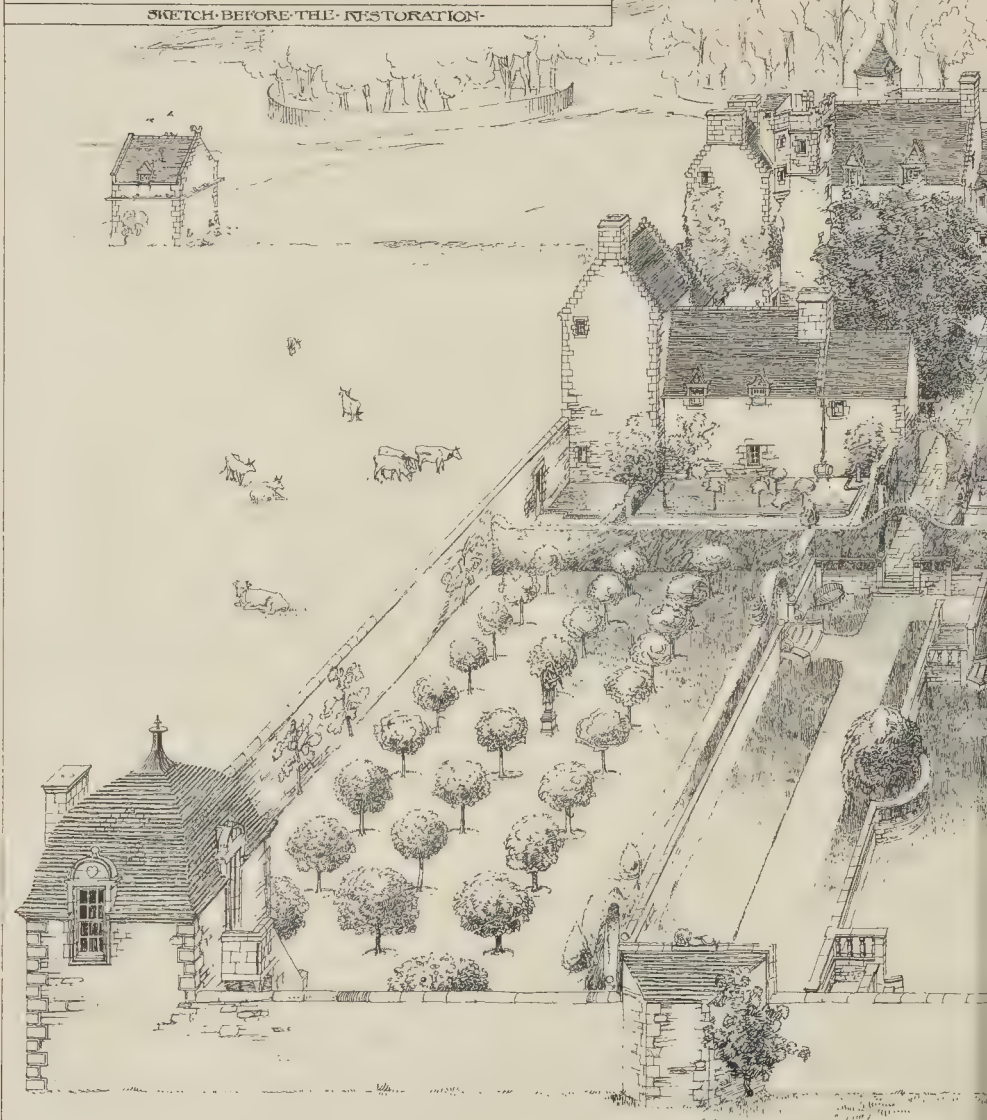


EARLSHALL

FOR R. W. MACKENZIE, ESQ.

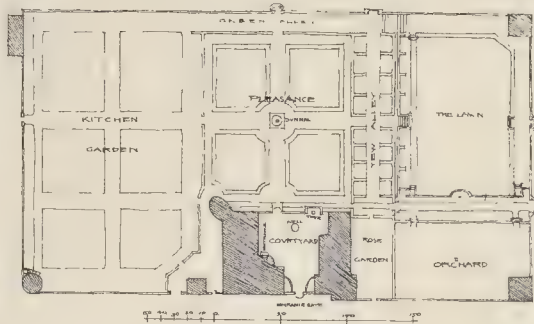


SKETCH BEFORE THE RESTORATION



THE HOUSE AND GARDEN. AS RESTORED. 1890-1894.

LSHALL. R. S. LORIMER, ARCHITECT.
49, QUEEN ST. EDINBURGH.



PLAN OF THE GARDEN.

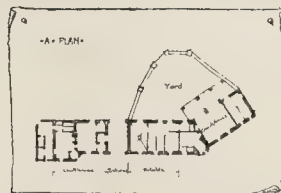
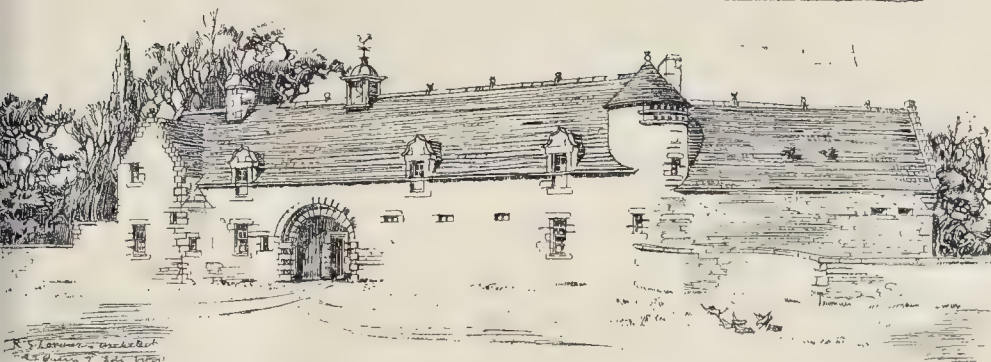




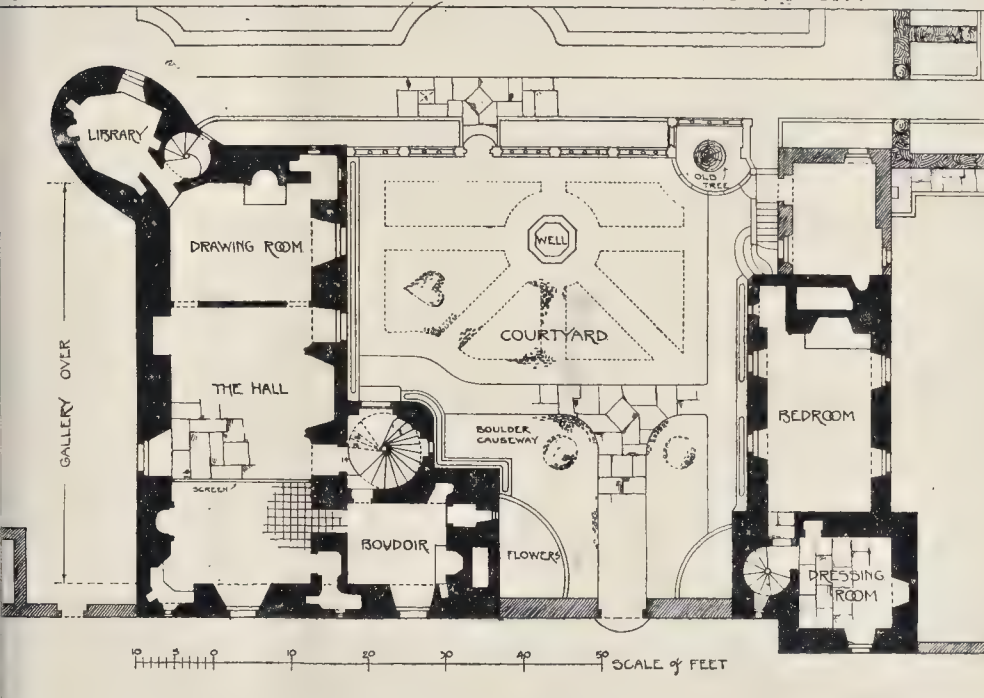
EARLSHALL: DETAIL OF CEILING IN GALLERY.

EARLSHALL FIFE

VIEW FROM THE SOUTH-EAST CORNER OF THE HOUSE



EARLSHALL · FIFE PLAN OF PRINCIPAL FLOOR.



permission of the owner, paid a visit to the

the ancient Earls of Fife are supposed at one time to have had a castle in the neighbourhood; the name. The first trace to be found of the name of Earls Hall is in a charter of James IV., dated March 28, 1497, whereby the King bestows the lands of Earls Hall and Prusk. It is of his son Sir William that it is recorded on his tombstone: 'Fair lye of al pietie are lantern bricht, Schir William Bruce, Erlshal, Knycht.'

it is the fifth laird whose name is associated with the building of Earls Hall. He succeeded in the year 1580 and was twice married, first

to Elizabeth, daughter of Sir Andrew Wood, of Largo, who appears to have died early, as Sir William's name is most frequently seen in conjunction with the initials of his second wife, Dame Agnes Lindsay, the device of two intertwined hearts bearing the initials 'W. B., D. A. L.' occurring many times in the decoration of the house. Sir William had much reason to be grateful to his lady, for it was apparently with her money that the Earls Hall as we now see it was built and garnished.

Towards the end of the eighteenth century, the estate passed into the hands of the Hendersons of Fordel, and was sold in 1825 by Sir R. Bruce Henderson, to the late Colonel Long, of Bromley

Hill, Kent. He, however, never lived in the place and was allowing the house to fall into utter ruin, when it was sold by his representatives a few years ago to the present proprietor, and it could not have fallen into the hands of anyone with a keener appreciation of its charm. It is needless to describe the state of dilapidation and decay into which the house had fallen, after being left for more than seventy years, not only to the elements, but to the tender mercies of every trip and Sunday-school treat in three or four counties.

The plan of the house is a development of what is called the L plan, that is two buildings at right angles to each other, with the main staircase in a tower in the internal angle, and in this case there

is also a large tower at the north-east angle corner. The staircase tower is carried up to the top, and there finished with a small turret, which gives access to a platform roof, commanding a fine view of the surrounding country, with St. Andrews in the distance.

In continuation of the western front there is a high enclosing wall, connecting the main house with some smaller buildings which are locally known as 'Dummy Daw's House,' the whole forming a courtyard, in which the old draw-well is placed, and enclosed on the east side by a low wall and balustrade, and this side of the courtyard opens directly into the garden. Unhappily all traces of its design had disappeared, the walls alone remaining. An attempt, however, has been made to lay it out on what were probably the old lines, some of the old Scotch gardens having been studied for this purpose. This—of having the garden close to the house—was the old traditional arrangement.

Though not large, the house contains several notable rooms, the most interesting of which is the gallery on the second floor, measuring 50 ft. by 18 ft., and some 13 ft. high, and containing a painted ceiling of very curious design. This is a wooden boarded ceiling taking the form of a flat semi-ellipse, and comes down on to the walls without any cornice or moulding. The upper part of the wall is divided into compartments by arched formed of painted pilasters and flat arches. In each compartment was a motto—most of these have long since disappeared, one of the few remaining informs the reader that a 'nice wyl and a back doore, oft maketh a riche man poore.' The ceiling itself is divided into upwards of three hundred panels, alternately square and circular, and joined by scroll work. The circular panels are filled in with heraldic devices, the arms of Bruce of Earlsburg being depicted in the centre, and immediately around are grouped shields bearing the cognisances of the families with which the Bruces were allied matrimonially, and to the west, the arms of many of the noble families of Scotland. On the eastern portion are seen mixed up in the most naive confusion, the coats of many notable characters in both sacred and profane story—'Arthur of Brittainne' keeping strange company with 'Judas Macabeus'; 'David, King of Israel,' jostling 'Hector, Prince of Troy'; figures of the Cardinal Virtues are also represented, decked out in gay seventeenth-century costume. The source of all this inspiration was found to be Sir David Lindsay's heraldry, which is preserved in manuscript in the Advocates' Library, and was a few years ago reproduced.

The square panels are filled in with representations of animals; the source from which these were taken has not yet been traced, but there is little doubt they were copied out of some medieval 'Bestiary,' of which examples still exist in the Bodleian at Oxford, and elsewhere. They were the precursors of our natural histories of to-day, but many of the animals represented must have had their origin in the designer's fertile imagination, as they are such as never were on land or sea. The decoration, which is in black and white distemper, is altogether a piece of seventeenth-century fancy work quite unique in its kind. Its preservation was a task of some difficulty, owing to the deplorable condition that the roof of the house had been allowed to get into. It was only where the work was clearly legible that it was touched—where the devices in the panels were gone altogether no attempt has been made to replace them.

The ceiling in a bedroom shows decoration of a similar character. This is a flat ceiling formed of massive beams with plain boarding. The space between the beams is divided into panels by scroll work, and with a picture of an animal in each alternate panel; the beams themselves having very roughly painted on them, in black on white, stars, flowers, and conventional meanders.

The other ceiling of interest in the house is that in the small panelled parlour on the first floor, which unlike the others is in colours, which must once have been bright. It is a flat ceiling, roughly boarded, and to a large scale are painted the arms of Sir William Bruce and his lady.

It is curious in a house of this date to find that it does not contain any enriched plaster work, a form of decoration in which some of the old Fife houses are very rich.

A very elaborately framed and panelled oak door, leading from the gallery to a small bedroom at the top of the north-east tower, is worthy of note.

The 'cat hole' is to be seen cut through the lower panels of many of the doors. This seems

to have been a common custom, and sometimes the hole was provided with a little sliding shutter on the room side of the door. The use of these holes apparently was to enable the cat to hunt the house from attic to basement, whenever the humour seized her.

The fireplace in the stone hall is also worthy of note, as it has a granite lintel 11 ft. long by nearly 2 ft. deep."

MAGAZINES AND REVIEWS.*

THE *Art Journal* devotes illustrated articles to the work of Mr. Dendy Sadler and the memory of Caldecott; the former by Mr. F. G. Stephens, the latter by Lady Dilke. Miss Hepworth Dixon contributes also a well-written and thoughtful article on the deceased French painter Monticelli, whom perhaps she rather overrates. "The Home of William the Conqueror" is the title of a supplement article on Caen and its architectural monuments.

The *Studio* publishes reproductions of some of M. Helleu's dry-points, and a good article by Mr. Wedmore on "The Art of the Pastellist"; also an "interview" with Mr. H. S. Tuke, with illustrations from several of his works.

The *Atlantic Monthly* contains two articles of special interest to our readers; one is "An Architect's Vacation," by Mr. R. S. Peabody, No. 1. of a series, and which deals with "Rural England." The writer shows a correct appreciation of the characteristics of English county architecture, both of the mansion and the cottage type, and it is of some interest to notice how its characteristics appear to the eye of an American architectural visitor. The following passage is worth quoting:—

"When we forget the poor man and his surroundings, there is little left in England that is not beautiful. 'Long and low' are words that best describe the elements of English building design. The long, low walls of the cathedrals offer striking contrasts to the masses of masonry that tower above such towns as Beauvais and Amiens, while the minute entrances at Wells have little relationship with the gorgeous portals of the great French churches. Castles like Penshurst, Stokesay, and even Warwick, have the same English qualities, and you look in vain among them for the snap and dash and fire of the French châteaux, such as Pierreferme or Falaise or Azay-le-Rideau, with their conical towers and many-vaaned spirelets. In the same way, also, the cottages that throughout England blend so softly and so picturesquely with the peaceful landscape have widespread, home-like roofs, and lie close to the ground, so close that you step down into most of them."

The other article we referred to is one by Mr. J. M. Ludlow (also to be continued) on "The Childhood and Youth of a French 'Maçon,'" an article founded on a French publication which appears to be in the main autobiographical. The same number contains the continuation of an exceedingly interesting set of articles on the physical conditions and conformation of the planet Mars, and the probable facts as to the "canals" on the planet, by Mr. Percival Lowell.

Harper contains an article by Mr. Royal Cortissoz on "Some Imaginative Types of American Art," dealing chiefly with the work of Mr. Dewing and Mr. Tryon, two painters whose works are not much known in England. Among the illustrations given, that from Mr. Dewing's "A Summer Evening," with the three women standing in thoughtful attitudes amid a twilight landscape, is beautiful, but it is essentially French in sentiment and composition. American art is an echo of some of the finest phases of modern French art, but only an echo. Mr. Julian Ralph contributes an article on "The Garden of China," with illustrations by Mr. C. D. Weldon. Mr. Thorpe's article on "The University of Pennsylvania," is both interesting historically, and for its illustrations of some of the university buildings, old and new.

The *Nineteenth Century* contains an article by Mr. Schooling on "colour-music," written two years ago, long before the recent demonstrations. Mr. Schooling does not make the mistake of supposing that we can go about and invent and perfect a new art off-hand; he quite recognises that it is a matter of slow development, but the suggestions which he makes are much more on the right track than those of Mr. Wallace Kimington. His idea of a colour-instrument is

* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.

of a succession of vacuum tubes or chambers which could be illuminated by means of a keyboard, the action of which would pass electric currents through them. There is something to think about in that. The author avoids the mistake of pretending to divide colour into a scale in any way corresponding to the musical scale. Some kind of scale or ratio there would probably have to be, to produce formal works of art, but there is no need to imagine it as having any proportional resemblance to the musical scale. The article is worth reading. Prince Kropotkin gives in the same number one of his useful summaries of "Recent Science," of which the most interesting portion to our readers is that which is concerned with the important result which antarctic exploration might have in giving opportunity for additional pendulum measurements of the configuration of the earth, the form of which is now believed to be less symmetrical than orthodox geodesy has assumed.

To the *Century* Mr. James E. Keeler contributes a "popular" scientific article on "Picturing the Planets," accompanied by reproductions from drawings of Mars, Jupiter, and Saturn. He gives one or two examples, showing emphatically how important an element the advance in the size and magnifying power of telescopes has been; the large telescope in the Lick Observatory in one instance entirely contradicting the evidence of a smaller instrument as to the outline of Saturn's shadow on its rings. In spite of the numerous difficulties, not only in constructing but in using instruments of very high powers, we do not believe that the limit in telescopic power has been reached yet. The series on "Old Dutch Masters" illustrates Terburg, with some rather meagre remarks, and an engraving. A Japanese "Life of General Grant," with eleven reproductions of the original Japanese illustrations, is a contribution of rather curious interest.

In the *Gentleman's Magazine* Mr. E. Johnson's record of "A Drive from Paris to Nice" is an interesting topographical sketch of the country passed through, and may suggest a new experiment in holiday excursions.

Scrivener's includes what we might almost call "the usual article" in American magazines on designs for posters, a subject we are getting rather tired of, though it must be admitted that there seems to be an almost endless variety of illustrations to choose from. The direction in which the progress of improvement" in this class of design has moved is illustrated, with what seems to be an unconscious and unintentional satire, by the placing on opposite pages Fred Walker's fine design for the "Woman in White" and an unpublished poster design by Mr. Aubrey Beardsley, one of the most hideous things we have ever seen on paper. The "American engravers" chapter deals with the work of Mr. Eldridge Kingsley, one of whose engravings—of a landscape—a work of much feeling and delicacy, forms the frontispiece to the number.

The *Fortnightly Review* includes an article by Mrs. Pennell on the French exhibitions of the year, of the usual pessimistic character. Art criticism seems to consist now in sneering at all painters except two or three who hit the critic's own pet ideal. There must be a reaction from this kind of thing before long.

In the *Contemporary Review* Mr. A. Wollaston Hutton writes an article in recommendation of the establishment of a National Opera House, urging that the Government should set apart a site and erect a new building out of public funds. To be leased at a nominal rent to the London County Council, who should maintain the building out of municipal funds, and sublet it under stringent conditions, but at a nominal rent, to operatic managers. While thoroughly sympathising with the idea of a National Opera House, we can only remark here that the suggested site—the vacant land opposite the Horse Guards—would be a mistake, just as Mr. Mapleson's opera house on the Embankment proved to be; it is too far from the best residential districts. A situation like that of the Queen's Hall would be more to the purpose.

Longman's Magazine reprints Sir B. Richardson's address on "Past and Ideal Sanitation," delivered before the Sanitary Congress at Manchester in April last. There is a good deal (as the title half implies) that is somewhat Utopian in this article. The suggestion about continuous terraces on the house-tops, and their arrangement and connection, for instance (page 287), however attractive, is perfectly impracticable, unless all the houses were first built over again with special constructive preparation for it. Unfortunately, "ideal" sanitarians do not hamper themselves with considerations as to constructional conditions. "Vernon Lee" contributes to the same maga-

a charming little article on "Old Italian Gardens." In the *Pall Mall Magazine*, Mr. Grant Allen's paper on "Evolution in early Italian Art," dealing with the subject of "The Annunciation" is treated by successive painters, is interesting and well illustrated.

The most interesting articles to us in the *Engineering Magazine* (New York) are those on "Power, Light, and Heat in City Blocks," by J. E. Talbot, suggesting the combination of electricity and steam, on "A Wooden Stove-pipe Conveying Water"—a very large one, the construction of which is illustrated by numerous drawings; and on "Heating and Ventilating All Buildings," by Mr. L. Allen. This last is a peculiarly American problem, but to no extent become an English one also.

The *Antiquary* contains an article by Mr. F. Verelst, "Quarterly Notes on Roman Britain," and an illustrated article on "Some Medieval Closing-rings and Knockers" but the illustrations strike us as being rather well-known samples.

The *Reliquary and Illustrated Archaeologist* contains an article by Mr. Leader Scott, on "The Roman Thermæ of Fiesole," with a plan and two photographs.

The fifth number of *Royal Academy Pictures* includes the set, a very good pictorial résumé of the contents of the exhibition.

The *Monde Moderne* gives some personal impressions of "China," and an article of some interest on old Parisian streets and their associations and the history of their names, under the title "A Travers les Rues de Paris."

We have received No. 22 of the monthly issue *Punch Pictures*, which includes some admirable specimens of the art of Charles Keene, and some of his favourites by Leech, which will be remembered and welcomed again by many. It is the work of these two deceased artists, and an occasional (too rare) bit of Richard Doyle, that gives the real value to this re-issue: that of Keene more especially, who was the finest genius *Punch* ever had on his artistic staff.

KEW BRIDGE.

The Surrey County Council have, unfortunately, at last been obliged to recognise that the present condition of the road bridge over the Thames at Kew is such as to necessitate the building of a new structure, and they have consequently just made an important communication to the Finance Committee of the Middlesex County Council in reference to this matter. It is proposed that committees of the Surrey and the Middlesex Councils should meet for the purpose of coming to some arrangement regarding the operation of the cost each of these bodies should describe towards the rebuilding of the bridge.

It appears that in 1757 one Robert Tunstall, applied to Parliament, and ultimately obtained permission to build a toll-bridge over the river at this site, to supersede a ferry owned by himself, and which, up to this date, was the only means of communication between the villages of Kew and Twickenham. The influence of barge-owners and their interest in the navigation of the river at this point caused certain privileges to be inserted in the Act, and it was not until the following year that the sanction to construct a bridge was obtained. The structure which was then erected, consisted of eleven arches, the seven central ones being composed of wood, and the remainder of stone; but this bridge only appears to have lasted out twenty years, as, in 1782, we hear of a son of the builder petitioning Parliament for authority to reconstruct it, and, having obtained the necessary permission, he commenced the building of a new existing bridge.

This bridge, which is only 24 ft. wide between parapets, took some six years to construct. It consists of seven stone arches, the central one having a span of 66 ft. The span of each of the adjoining ones is 55 ft., and that of the two others on either side is slightly less. There are also several small arches on the low ground of the river shore. As far as architectural appearance, the bridge is one of the most beautiful on the river; but the rise is too great, and consequently the approaches too steep, for the class of vehicular traffic it is now necessary to accommodate. It may be added that the arches are too low, especially considering the strong tides at Kew, to be convenient or quite safe for the water traffic.

For many years this bridge remained the property of the builder, but was at length sold by him for 22,000*l.*, and continued in the hands of private individuals until 1872, when it was bought

by a joint Committee of the Corporation and the Metropolitan Board of Works. The original claim as compensation in respect of tolls was at this date some 74,000*l.*, but the owners ultimately agreed to accept 57,300*l.*, and the purchase being completed the bridge was thrown open free to the public.

That the demolition of this bridge must come about soon we had long foreseen; but it is melancholy to think that there is probably not the least chance of its being replaced by anything half as picturesque.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Jobbing Works Schedules.—The General Purposes Committee brought up the following report, the recommendation being agreed to:—

"On June 19, 1894, the Council resolved that a schedule of prices should be agreed upon between the Works Department and the Architect and Engineer, upon which, in respect of jobbing works, the estimates, measurements, and certificates of the Architect and Engineer should be based, and that the schedule should be revised periodically. On February 26 we reported that a schedule of prices for jobbing works to be done under the supervision of the Architect had been prepared, and the Council resolved that 72½ per cent. should be allowed above the schedule of prices for such works. On March 25 we reported that a schedule of net prices for hoarding and shoring works had been agreed to by the valuer, the Architect, and the Manager of Works, the prices being the same as those charged under the last contract for similar work. We have now to report that an agreement has been arrived at as to the schedule of prices for works carried out under the supervision of the Engineer. It has been suggested that the rate above the schedule of prices at which these works should be carried out by the Works Department should be provisionally fixed at 10 per cent. Before these jobbing works were handed over to the Works Department, they were done by contractors, one of whom received 7 per cent. and the other 8 per cent. above the schedule prices. The reasons assigned by the Works Committee for the increase of an average of 2½ per cent. on the charges of the last contractors are (1) that since the last contract was entered into on January 1, 1893, the Council has laid down a schedule of hours of labour and rates of wages which contractors have had to adopt, and which are, of course, observed by the Works Department; and (2) that these works, which extend all over London, are carried out by the Works Department from one centre, whereas, when done by contractors, London was, for the purpose of these works, divided into two districts. The Works Committee suggest that the arrangement should be in force during the current year, viz., from April 1, 1895, to March 31, 1896, in order that all accounts for the year may be rendered on the same basis. We concur in the suggestions of the Works Committee, and recommend—

"That the rate above the schedule for prices of jobbing works to be carried out under the supervision of the engineer be provisionally fixed at 10 per cent. above the schedule of prices in the last contract for similar works, the arrangement to be in force during the current year, namely, from April 1, 1895, to March 31, 1896."

Proposed New Street, Holborn to the Strand.—Mr. Beachcroft asked the Chairman of the Improvements Committee whether the scheme for the new street between Holborn and the Strand would be matured in time for the issuing of the necessary Parliamentary notice this year.

Mr. Goodman said he could not say. The project was a very important one, and the committee desired to have full time to consider it. They had already instructed the officers to bring up plans of all the schemes that had been proposed in the past, and to indicate which in their opinion was the best one.

Mr. Emden, later in the sitting, asked when it was proposed to deal with the unsanitary area near the Strand known as Clare Market.

Mr. Bruce said the matter would be considered in conjunction with the proposed new street.

After transacting other business, the Council adjourned shortly before six o'clock.

METHODIST BUILDINGS, CAMELFORD, CORNWALL.—A new chapel is being built at Camelford in connexion with the United Methodist Free Church. Messrs. Wise & Wise, of Launceston, are the architects. The contractors are Messrs. Hooper & Dennis.

SCREEN, ST. JOHN THE BAPTIST, KENSINGTON.—Mr. Jas. Brooks writes to say that in the description of this screen, which was illustrated in our number for June 29, it should have been mentioned that the sculpture was executed by Mr. J. E. Taylerson.

Books.

Architecture for General Readers; a Short Treatise on the Principles and Motives of Architectural Design. With a Historical Sketch. By H. HEATHCOTE STATHAM, F.R.I.B.A.; Editor of the *Builder*. With Illustrations drawn by the Author. London: Chapman & Hall. 1895.

THIS book cannot or course be "reviewed," in the ordinary sense, in these columns, but we may draw attention to its existence, and explain that the object of it is to supply—what we believe is much wanted—a book of moderate size giving such an outline of the conditions and objects of the art of architecture, and of its general history, as may be of interest to educated persons who have no professional connexion with architecture.

The first portion of the book is critical, and the relation of construction to design is illustrated by an analysis of the Greek and Gothic styles of architecture, as being the most complete examples of treated and arcuated construction respectively; the statical conditions of the beam and arch being explained so far as is necessary for understanding their influence on design. The first chapter deals with what may be called the philosophy of architectural design, including some special exposition as to the importance of plan in its relation to design, and of the objects to be aimed at in planning a large building. A chapter is devoted to "Mouldings" (a subject generally almost passed over in books for amateur readers), another to architectural ornament, and another to architecture as considered in its relation with the general aspect of cities and of landscape. The second portion of the book consists of a brief sketch of the history of architecture, in which the attempt has been made to treat historical architecture as one development, the different forms of which are all more or less connected with each other, instead of dividing the subject up into chapters on various styles and countries. The book contains about 300 illustrations, all drawn by the author, and (with the exception of the frontispieces to the first and second parts) drawn specially for this publication.

Though the book, as its title implies, is not addressed to architects, some points in it may, perhaps, not be without interest for them, and possibly also it may be useful to young students for the profession, as a first book to give them an all-round view of the subject: but this is for others to decide.

Examinations for Local Surveyors. Questions set at the Examinations of the Sanitary Institute; the Surveyors' Institution; the Municipal and County Engineers' Association; the Worshipful Company of Carpenters. With Answers. London: The Sanitary Publishing Co., Ltd.

We are afraid that we cannot compliment the author of the answers given in this book, and we venture an opinion that a candidate for examination relying upon them would have a doubtful chance of success. We have only space to allude to a few inaccuracies, but these will show the absence of care used in the preparation of the book. Under the head of "Rivers Pollution Act," the effect of the Act of 1893 is said to make a Sanitary Authority responsible for an offence against the original Act, "whether the sewer was constructed prior to the passing of the Public Health Act or since that date." This is surely an extraordinary deduction from the text of the Amending Act, and the Public Health Act has nothing whatever to do with the matter.

In defining hard and soft water it is stated that "water at or below six degrees of hardness is considered soft, above twelve degrees hard." We were under the impression that water is usually specified as "hard" when it possesses more than six degrees of hardness.

Referring to ventilation and cubic space, it is stated that "it has been accepted as a standard of purity of air that the carbonic acid must be kept below 0.6 volumes per 1,000." "Must not exceed" was the accepted standard, but this standard has been proved unreliable from experiments made by Carnely.

In describing the A.B.C. sewage precipitation "as used at Aylesbury," it is stated that alum, blood, clay, and charcoal are used. Blood is now omitted as an ingredient.

This book is one of a class inimical to the system of examination as a test of efficiency, as it gives facilities for obtaining certificates by means of a fair memory, with an entire absence

of knowledge of principles involved. When we remember the large powers which are placed by Government in the hands of sanitary officials, enabling them to put property-holders to considerable expense, and also remembering that Government has recognised the possession of certificates as a qualification for such officers, it is clear that a determined stand should be made against any system which may tend to rob such certificates of their value.

Les Artistes Célèbres: Hubert Robert et Son Temps. Par C. GABILLOT. Paris: Librairie de l'Art, Rue de la Victoire. 1895.

HUBERT ROBERT, whose name and works are not much known in England, may be called the French Pannini, and perhaps owed some of the suggestion of his style of subjects to Pannini, who was a little before him in date. Robert spent a long time in Italy making studies of the remains of Classic architecture, which he reproduced in a pictorial form, but in a more picturesque and less conventional manner than Pannini. Many of his compositions which are illustrated in this work are very good, and of considerable interest for architects. He was also, as the reproductions from some of his red chalk studies indicate, a good and free sketcher of landscape and foliage, apart from the architectural subjects which seem to have formed his principal interest.

Hubert Robert returned to Paris in 1765, after an eleven years' sojourn in Italy, bringing with him an immense number of drawings and studies, and, his name being already known to connoisseurs, he soon achieved a wide reputation, especially as the style of his compositions fell in with the then predominant taste for everything Roman.

The book in which this life and works are considered by M. Gabillot, is one of the most copious of the series to which it belongs—more so, in proportion to the rest, than the fame or artistic importance of Robert would justify; but it deals also with a very interesting period, and gives a great deal of information about other artists and personages of the time, as well as about the one to whom it is ostensibly dedicated.

Sussex. By AUGUSTUS J. C. HARE. London: George Allen. 1894.

A USEFUL popular guide to the county of Sussex, with a good map, and containing a considerable amount of historical and legendary information connected with the towns and localities mentioned. The book would be more agreeable reading if the author were not so continually in "a temper" with somebody or something, chiefly in relation either to ancient remains or modern architecture, about which latter he almost always speaks with a contempt which has something of impertinence about it. Even if he were always right, which we question very much, a guide-book is not the place for these demonstrations.

As the author expresses a wish to be informed of any omissions, we may observe that the interesting little brick church of Twineham, in a very out-of-the-way situation, appears to have escaped his notice.

Archæologia Oxoniensis. Part V. London: Henry Frowde. 1895.

THE *Archæologia Oxoniensis* increases in size, the Fifth Part containing more papers and a greater variety of interest than we remember in any previous number. Mr. Park Harrison writes a very interesting article on the architecture of the Bodleian Library and the old Schools, in which he seems to show pretty clearly that Sir Thomas Bodley, like other "building-owners" of his age, was to a great extent his own architect—at least that he directed the main design, though he may not have supervised all the details. The *Archæologia* is not now confined to Oxford, but contains a kind of appendix of "Recent Discoveries," antique and Medieval.

Bletchingley: a Disfranchised Surrey Village. By J. TAVENOR PERRY. London: B. T. Batsford. 1895.

THIS illustrated pamphlet appears to be "No. 1" of a series under the general title "Bye-way History, or short studies of out-of-the-way places." It contains historical notes accompanied by a good many sketches of curiosities of the place; old houses and details, the hour-glass bracket in the church, &c. Records and sketches of old villages on this plan ought to be of considerable interest, and we hope the series will be continued.

The Student's Column.

METALS USED IN BUILDING.—II.

THE PRINCIPAL ORES (continued).

THE majority of the ores of iron mentioned in the last article are exceedingly common in Nature. They chiefly occur in three different manners:—(1) Permeating the sedimentary rocks, (2) Crystalline grains in other rocks, or fibrous, and (3) In veins or lodes.

In reference to the first-mentioned mode of occurrence we may instance the Northamptonshire iron ore as a case in point. This is found on the geological horizon known as the Northampton Sand, which is a thick bed of sand, siliceous, calcareous, or micaceous, usually exhibiting much oblique lamination, often more or less hard, and sometimes interstratified with beds of clay. The upper portion of the formation is usually composed of sands and clays, whilst the lower is impregnated with iron. Professor J. W. Judd, C.B., remarks* that when quarried at the surface the iron-ore is seen to be composed, to some considerable depth, of the hydrated peroxide of iron only, which is the sole form in which it is worked. With greater depth, or where the bed is covered over by thick deposits, as in some outliers, or on running into a hill, the character of the iron entirely changes, being, in fact, an impure carbonate of a bluish or greenish-grey colour. This is due to the circumstance that where it comes out near the surface the iron, as might naturally be supposed, has been more readily oxidised, and the process has been assisted by percolating water; the solid carbonated beds below, on account of the closeness of their joints, are much less pervious. In many cases the iron is found a few feet from the surface, and is dug from a long wall or face of the deposit. On the ground it has the aspect of clinkers and ferruginous earth. Such clinkers are generally of a deep brown colour, but when broken are seen to have a brownish-purple or blue heart. No ore could be more easily obtained than this one; it is generally loose enough to be broken down by bars, and is then thrown up into railway trucks, temporary lines having been laid along the face of working for the time being. The mould, or overburden, taken away as the face is dug into is carefully preserved, so that when the ore has been removed (it is only a few feet in thickness) the surface of the field may resume its wonted aspect by the earth being replaced.

Iron also occurs (limonite) in sedimentary deposits as irregular pans. The Hythe beds of the Lower Greensand in many parts of Surrey contain enormous quantities disposed in this manner. Some time ago we gave an illustration† of a section at Tilburston Hill, near Godstone, to show the effect of these hard iron bands in assisting the formation to resist the action of denudation, by which bold surface features were produced. In that case the iron is not disposed as clinkers, but as irregular, wriggling bands an inch or so in thickness, permeating the soft, ferruginous sand in all directions. Occasionally it is considerably twisted, and forms distinct pipes of iron. In the Middle Ages this ore and others similar to it in the Wealden area were used in iron manufacture.

Yet a third method of occurrence in sedimentary rocks—as minute grains. These iron grains may occur alongside such ores as that described from Northamptonshire, or the Lower Greensand of Surrey, or they may be the most abundant constituent of a sand suitable for the production of cast iron. Sometimes they are found to the exclusion of practically all other matter, as near Abbotsbury, in Dorsetshire, where one may see them at the surface in the form of little shots, in reality oolitic granules changed into iron. A certain amount of consolidation would render these similar to the celebrated iron-ore of Cleveland, in Yorkshire. At the last-mentioned locality, the original character of the rock is entirely replaced by iron, and made into ironstone. The main "seam" of Cleveland iron-ore has an extent of between 300 and 400 square miles, but only the north-eastern portion of the area contains really good mineral. The ore is usually rather thickly bedded, and towards the base has a somewhat greenish-grey tinge. Except at the outcrop, it is mainly in the condition of ferrous carbonate, with a small admixture of the peroxide. Silicate of iron is present, especially in the oolitic granules. It may be remarked that replacement of original

constituents by iron, whereby we have an exact duplication of the original, is a very common feature with iron-ores found in sedimentary rocks in many parts of England.

Iron ore frequently occurs as the matrix of sandstones—binding together the divers particles composing the rock. Then we have the clay-ironstone of the Coal Measures; solid sheets of which are found over large areas, elsewhere represented by nodules occurring along definite lines, as in South Yorkshire and Derbyshire. This, as its name implies, is a clay, bound together into solid stone by iron, though a large amount of replacement may have taken place. The term clay-ironstone is sometimes applied to an ore of an exceedingly pure character, however, from which aluminous earths may be, practically, absent.

We have said that we do not intend to go into the abstruse subject of the origin of ores; but a great deal will, inferentially, be learnt concerning the matter from their mode of occurrence, and the student finds it difficult, in looking over divers samples of ores, to dissociate their appearance from their origin, whatever that might have been. Everyone knows that iron occurs in solution in many different kinds of river and spring water, but few persons have any idea as to how rapidly that iron may be parted with to form a solid mass. The process is sometimes effected in a few days. Go, for instance, to Black-gang Chine, in the Isle of Wight, and walk thence on the shore towards Atherfield Point. The cliffs are seen to be composed of several kinds of sedimentary deposits, more than one of which cropping out just above the beach contains enormous quantities of iron-ore weathered into most grotesque shapes, forming ledges and honeycombed rocks. From these beds issue little springs of water impregnated with iron, which ceaselessly trickle over the beach. Here and there in sheltered nooks, or convenient places, the iron is rapidly separated from the spring water (by agencies the nature of which we need not stop to inquire into) and constitutes a cement, binding patches of beach-gravel, sand, and shells together into solid slabs and blocks. In parts of Cornwall gravel made into stone by this process only yesterday, as it were, is sufficiently compact to be used as a rough building material.

Bog iron ore, or lake ore, as it is sometimes called, is a commercial product forming at the present day in Norway, Sweden, and elsewhere. In colour it is dark brown to black, and may be earthy or compact. It is a mixture of hydrated peroxide of iron, phosphate of iron, and hydrated oxide of manganese, frequently with clay, sand, and organic matter. Lake ore is obtained from the bottom of lakes, in which it forms everywhere on the shallower slopes, near banks of reeds, where there is no strong current of water. It occurs in granular concretions of the size of small shot up to nodules 6 in. in diameter, the deposit being from 8 in. to 30 in. in thickness. This ore is obtained during the winter by inserting perforated iron shovels through holes cut in the ice, and so rapidly do these deposits accumulate that the proprietor can reap a crop, perhaps 6 in. in thickness, every twenty-five years.

Turning now to the mode of occurrence of iron ores placed in our second category, it may be noted that crystalline grains of magnetite are scattered throughout a very large number of igneous and metamorphic rocks, but not often in sufficient quantity to warrant their being exploited as an ore. The best-known form of iron occurring in Europe under the conditions indicated is that from Gellivara, in Sweden, where, some people would have us believe, there is a mountain made of magnetic iron ore. As a matter of fact, the ore in question occurs in a foliated crystalline rock composed of hornblende, mica, feldspar, apatite, and other minerals, whilst an official report states that the bands containing the principal part of the ore occupy only about 160 acres of the surface of the mountain, though from the high angle at which the beds are inclined the ore in most places reaches to an unfathomable depth. As a rule it is magnetite, often with a central core of hematite, much of which is by no means crystalline. In some cases the ore and the rock containing it pass into each other. On the whole, the magnetites in the Archaean rocks of New York and New Jersey occur in the same manner. In the Penokee Iron-bearing Series of Michigan and Wisconsin the ores sometimes lie in isolated and irregular patches from 10 ft. to 30 ft. in thickness, disposed in a lens-shaped manner. These lenses are separated by barren rock in places 100 ft. in thickness. The iron is enveloped by quartzite, and often there is a layer of what the miners call "paint-rock" (argillaceous

* "The Geology of Rutland, &c.," 1875, p. 115.
† *The Builder*, Oct. 28, 1895.

material) between the quartzite and the ore. In many places, however, the exploitable mineral is merely a few inches in thickness. The Huronian rocks of the Lake Superior region yield an enormous quantity of iron—limonite and hematite.

Specular iron occurs as separate crystals, and one variety is made of small flat scales resembling mica in appearance. Or, it may be found in a crystalline massive state, showing crystals in tints of steel-grey and of brilliant lustre. It is the prettiest of the numerous iron ores. Spathic, or "sparry" iron, may consist of nearly transparent glittering crystals, almost colourless. It is found extensively in Styria and Carinthia; also at Weardsdale in Durham, and in parts of Somersetshire. It almost invariably contains manganese.

The ores constituting our third category—occurring in lodes or veins—are common enough, but iron is such an abundant mineral that it pays to mine it in lodes only in few localities. According to the observations of Mr. Brenton Symonds* iron is widely distributed in the veins of all the metalliferous tracts, either in the form of sulphide or the depths of the mines, or as oxides in other situations. The most noteworthy deposits here are subordinate to the granite of the Hensarrow district. They occur on the backs of certain lodes running east and west, that traverse the clay slate near its junction with the granite, and in some crosscoursers. Large quantities have been raised at Restormel, Coldevreath, Fawton, and Tolbenny. Probably, the lode at the first-mentioned place has yielded more iron than any other in the county. It enclosed besides hydrous oxide, some hematite, specular ore and a little manganese. The well-known Perran iron-lode contains both limonite and chalybite, which have been raised at intervals for a number of years. The back of this lode has been oxidised to brown hematite to a depth of from 50 to 100 ft., but below the line down to which it is influenced by the atmosphere, a solid and practically exhaustless mass of ferric carbonate seems to extend the whole length of the lode.

From the practical point of view much of the hematite of Cumberland and Lancashire comes under this heading. The iron, however, occurs both in beds and in a vein-like manner. Mr. Kendall remarks that all the most important deposits in the Whitehaven district are by the de faults, as at the Salter Hall and Eskett mines. Here there is a combination of the vein-like and the bed-like deposits and the ferruginous is entirely dependent in its occurrence on faulting.

Other interesting points could be adduced from various parts of the country, but bearing in mind that we are not to say much in the present series of articles on iron, except in its connection with the preceding observations are sufficient for our immediate purpose as showing how the ore is found in Nature.

GENERAL BUILDING NEWS.

ASTON UNION, BIRMINGHAM. NEW COTTAGE HOMES.—The Guardians for this Union have recently instituted an open competition for cottage homes. Numerous sets of designs were submitted by architects. Mr. William Martin was appointed selector, and selected the designs prepared by Messrs. Franklin Cross and J. R. Nichols, of Birmingham, and awarded them the first premium of £700. The guardians have since resolved to employ the first premiated architects to carry out the work. The architects' estimate for the homes as 25,200l. The scheme embraces homes for boys and girls, probationary home, school, place of worship, infirmary, workshops, swimming-bath, bakery, pres, superintendent's house, fire-engine station, &c., and will be erected upon a site near to the railway Hill workhouse, but will have no connection with that establishment.

WESLEYAN BUILDINGS, BEBBINGTON, CHESHIRE. The New Wesleyan School Chapel at Bebbington is opened on Thursday last week. The works have been carried out by Messrs. W. H. Bleakley & Co., of Birkenhead, from plans prepared by Mr. T. Talsien Rees, also of Birkenhead. The church was 930l., furniture and fittings, 100l. The building is faced with red pressed bricks, lined with white Storeton stone dressings; the woodwork is pitch-pine. The building is a portion of a large scheme, the plans of which have included a chapel, vestries, &c., to cost about 300l.

RESTORATION OF EMPINGHAM CHURCH.—The rich church at Empingham, one of the largest in the diocese of Peterborough, has just been re-opened after restoration. The work of restoration has been

carried out under the superintendence of Mr. J. C. Traylen, of Stamford, the Diocesan Surveyor, and the contractors were Messrs. Edmund Roberts & Son, of Weedon, Northamptonshire. The cost of restoration has been about 2,000l. The church consists of a western tower and spire, nave with aisles, north and south transepts, and a chancel with a vestry on the north side. The church was built in the twelfth century, and was restored, if not almost rebuilt, in the thirteenth and fourteenth centuries. The earliest part is of the Early English period, the south arcade being most likely the oldest portion of the church. The present restoration was necessitated by the rotten condition of the roofs throughout. The crushed and insecure state of one of the pillars rendered imperative its renewal on a new foundation. Other pillars and the remainder of the fabric have been made thoroughly secure in this respect. No more has been done in the way of restoration than was absolutely necessary, the great aim having been to retain the ancient features of the edifice. This especially has been done in the windows, all the old glass having been used up, including interesting bits of stained glass, coats of arms, &c. The plaster also retains its ancient face, with scraps of wall painting hereon. Entirely new oak roofs, with thick lead covering, have been put up, the pattern of the old ones having been followed as closely as possible. The floor has been laid with stone. New wood-block flooring covers the seating area, and for the present the worshippers will be accommodated with 300 chairs. Hot water piping circulates through the old church and chancel, the heating arrangements being carried out by Messrs. J. L. Bacon & Co., of London. But little renovation was required to the fabric externally. The tower and spire have been pointed; the pinnacles have been restored; a lighting conductor has been supplied; and the parapets have been attended to. The chancel has not been touched. Outside, the ground has been lowered round the north side, thus enabling the north door and its approach to be restored to its original position.

CHURCH, PONTYCLUN, GLAMORGANSHIRE.—The New Church of St. Paul, Pontyclun, has just been consecrated by the Bishop of Llandaff. The church is built in a late period of Gothic architecture, and consists of a nave, with a chancel, vestry, and organ-chamber. Accommodation is provided for 350 people. The walls are built of local stone, with Bath-stone dressing, and the windows are all built with tracery heads. The main walls are grey, and the roof is of green slate with red tile ridges, surmounted by a bell-cote furnished with two bells. The walls inside the church are coloured buff. The contractor was Mr. John Morgan, Llantrisant, and the work has been carried out under the superintendence of Mr. E. M. Bruce-Vaughan, the architect. The cost is 1,500l.

ALTERATIONS TO ROSENEATH CHURCH, DUM-BARTON.—Roseneath Parish Church, Dumbarton, has just been reopened after alterations. The architects were Messrs. Burnett, Son & Campbell, of Glasgow. The joiners were Messrs. Maclean & Son, Roseneath; builders, Messrs. Macpherson & Currie, Cove; plasterers, Messrs. Rome & Co., Glasgow; slaters, Messrs. Thom & Son, Helensburgh; plumber, Mr. Shelden, Row; carved oak work, Mr. John Craig, Glasgow; marble work, Messrs. Galbraith & Winton, Glasgow; organ-builders, Messrs. Hill & Son, London.

CHURCH BUILDINGS, ABERDEAR, GLAMORGANSHIRE.—The memorial-hall and church erected at Aberdear to the memory of the Rev. R. Bowdler Jenkins has just been opened. The hall will seat a congregation of nearly 500 persons. The institute contains a boys' reading-room, a coffee-bar, and a room devoted to amusements. The mens' department consists of a committee-room, a reading-room, card-rooms, and billiard-rooms 42 ft. by 24 ft. The architecture was completed by the late Mr. Wakeling, of Merthyr.—*Western Mail.*

TECHNICAL SCHOOL, PRESTON.—On the 6th inst. the foundation-stone of the Victoria Jubilee Technical School, Preston, situated in Corporation-street, was laid. The plans for the school have been furnished by Messrs. Cheers, Aspinall, & Smith, of Blackburn. The building will cost about 16,000l., independently of fitting and furnishing.

NEW PAVILION, RYDE.—On the 4th inst. Sir Richard Webster opened the new pavilion which, during the last few months, has been constructed between the promenade and railway piers at Ryde, Isle of Wight. The building consists of an octagonal concert-hall, 65 ft. in each direction, and an annex, and is carried by iron columns sunk into the ground and thoroughly braced together. The hall is capable of seating 700 people, and additional accommodation is given by means of a promenade gallery, 10 ft. in width, supported by ornamental columns. The annex contains several large public rooms on the ground floor, and on the first floor other rooms are reserved for the use of the members of the Royal Victoria Yacht Club. The superstructure is composed entirely of wood, carried on a framework of steel joists. The work, which has cost 5,338l., has been constructed from the designs of Mr. R. St. G. Moore, the contractors being Messrs. Roe & Grace.

MISSION HOUSE, SHOREDITCH, E.C.—The foundation-stone was laid on the 6th inst. of a new Mission House, Shoreditch. The architect is Mr.

Richard J. Lovell, of London. The house will contain a mission hall, and several rooms available for large or small classes, while a series of bath-rooms for the use of poor women and children is provided. Besides bedroom accommodation for the ladies in residence, there will be a refectory and a private chapel. There is also to be a soup kitchen.

WESLEYAN CHAPEL, LANDRAKE, CORNWALL.—On the 9th inst. a new Wesleyan chapel was opened at Landrake. The chapel is built of local limestone with red brick dressings, and adjoins the northern side of the old chapel. It has a nave and two transepts, and the pitch-pine open benches will seat 150 people. The old chapel is to be converted into Sunday-school class-rooms, and has folding doors opening into the new building, the pulpit being so placed as to command a congregation in both buildings. The chapel, about 50 ft. by 30 ft., was designed by Mr. S. P. Hosking, built by Mr. T. Hawke, and fitted by Mr. J. Churchward.

SANITARY AND ENGINEERING NEWS.

HARBOUR TUNNEL, GLASGOW.—The Glasgow Harbour Tunnel, which passes beneath the Clyde at Finnieston, was opened on the 5th inst. In 1889 Parliament sanctioned the Harbour Tunnel scheme, which was promoted by a company formed for the purpose. The underground passage connects Mavisbank Quay on the south side with the Finnieston and Stobcross Quays on the north side, and consists of three tunnels, 16 ft. in diameter, the side ones for vehicular traffic and that in the centre for the passage on foot. The approach on either side is by a circular shaft, 80 ft. in diameter, in which are operated the hydraulic hoists, raising and lowering the vehicles as they leave or enter the tunnels. The shafts are formed of cast-iron segments and lined with brick-work, the material met with in digging on the south side being sand overlying builder's clay, and on the north side being clay exclusively. The material was excavated by hand, and carried to bank by cranes commanding each shaft. The tunnels themselves are also lined with cast-iron segments, filled in with concrete and lined with glazed brick. All the tunnels were driven by means of shields and compressed air, the average pressure ranging from some 12 to 15 lb. per square inch above atmospheric pressure, and the maximum attained (for one day only) being 21 lb. Each shaft contains six divisions for as many lifts, half being devoted to ascending and the other half to descending traffic. The maximum weight allowed for is about 5 tons, and the speed about 4 ft. per second. The hoisting appliances were supplied by the Otis Elevator Company, Limited, of London. Messrs. Simpson & Wilson, C.E., of Glasgow, were the engineers of the undertaking.

WATERWORKS, SALCOMBE.—New waterworks have just been opened at Salcombe. The water, says the *Western Morning News*, has been obtained from springs in Rood Vale, and the whole of the water has been collected in 9-in. pipes, and conveyed down to the pumping-station at Hanger in disconnected Stanford pipes. The pumping-station at Hanger occupies a site nearly 40 ft. square. The pump-house is fitted with a Priestman horizontal oil-engine of 6-horse power, and the water has to be lifted 350 ft. in height, and the rising main is of 4-in. diameter, of best grey metal, tested with a head of 400 ft., and coated with Dr. Angus Smith's compound. The new high-level reservoir is on the highest land in the district, called the Berry, and is 50 ft. long by 30 ft. wide and 10 ft. deep, and is closed in with 4½-in. brick arches in cement on rolled iron girders, and holds over 80,000 gallons. The works have cost over 3,600l. The contractor has been Mr. Jenkins, who has carried out the work under the superintendence of Mr. F. Bessley. Mr. James Patey was the clerk of the works.

MISCELLANEOUS.

LIVERPOOL ENGINEERING SOCIETY.—A party of the members of this Society paid a visit, on Saturday last, to the Dinorwic Slate Quarries, Llanberis, and the Snowdon Mountain Rack Railway. The quarries, which cover an immense area of ground, have been in existence for over 200 years, although but little work was done in them for the first half of that period, the greatest part of the progress having been made within the last sixty or seventy years. The party, led by Mr. W. Brinkman, A.M.I.C.E., were first shown the system of splitting and dressing slates. They were then conveyed in the rope tramways up the very steep inclines, some of which are at a gradient of from 1 in 3½ to 1 in 4. After an inspection of the interesting operations in the galleries, the arrangements for a very large blast, which is to take place in a few weeks' time, were shown. The party then visited the workshops. One interesting feature was the first engine used on the works from 1848 to 1882, but which is now laid aside. This engine was built by the North Fleet Iron Works, Kent. The large water-wheel, from which all the power is obtained for driving machinery, and is 50 ft. in diameter, was also a source of interest. In the works there are fifty galleries, which rise to a height of 2,000 ft. above the sea level. About 3,000 men and

* "The Geology of Cornwall," 1884, p. 186.

boys are employed in the works. After the inspection of these quarries—the party next proceeded to the Victoria Hotel at Llanberis, where a luncheon had been provided for their benefit by Messrs. Holme & King, the contractors for the construction of the Snowdon Mountain Rack Railway. The members next proceeded to visit the line of railway now under construction from Llanberis to the summit of Snowdon. This line, when completed, will be similar to the latest of the Swiss Mountain Railways, the gauge will be 2 ft. 7½ in., the gradients never steeper than 1 in 5½, and the curves never sharper than a radius of 4 chains. The system to be adopted will be the “rack,” composed of solid double cast-steel “cogs,” and the locomotives driving with two double pinions, four teeth, therefore being in gear at the same time. The length of the line is 4½ miles, and the road will be provided with terminal stations at Llanberis and the summit, with intermediate stations at two points on the route. It is intended to provide four locomotives of the latest and most improved pattern, with three trains of two carriages each, each train to accommodate 112 passengers. The locomotives are being manufactured in Winterthur, Switzerland, and the carriages and wagons are being built at Lancaster. It is intended that the transit from Llanberis to the summit should occupy under the hour, and the same in returning. On Monday some of the members visited the Yr Bîd Quarries of the Welsh Granite Company, under the management of Mr. George Farren, J.P., Assoc. M. Inst. C.E. Here the inclines range from 1 in 5 to 1 in 14, and the highest gully is about 1,000 ft. above the level of the sea.

THE ARCHITECTURAL MUSEUM.—In reference to a letter printed in our columns last week, we are officially informed that Mr. Sawyer, the writer of the letter, was mistaken in asserting that in order to sketch at the Museum it was necessary to pay “a gold coin” and become a member of the Westminster School of Art. The fees for sketches, irrespective of the School of Art, are 1s. a day, 2s. 6d. a month, or 10s. a year; moderate enough certainly.

MESSRS. W. & R. LEGGOTT, of Bradford, have just turned their business into a limited company. It is not offered to the general public, all the shares having been taken up by the proprietors, employees, and friends.

HILL'S NOISELESS FLAP VENTILATORS.—The ventilator thus described is the one shown on the inner side of the wall in the appended section, and is intended to be used as an exit or extract-ventilator, either into an extract-flue or in connexion, as shown here, with external wall extract-ventilator. The flap on the inner ventilator is really “noiseless.” It is made of oiled silk, and has also the advantage (which the patentees, by the way, do not mention) that even if the hinge is stiffened from rust or dirt and sticks (as often happens with the mica flaps) the flap, not being rigid, will still act. Whether it will always keep quite wind-tight under back-pressure might be a question, but we think it will be practically so. In case of the flap not being moved outward by a slight current of air, there is still room



for air to pass under it, as when not blown back it hangs vertically in the lower part of the wall. The outside ventilator is no doubt, as the patentees say, proof against wind and rain. As to the rest, we have little belief in the extracting action of any arrangement of “baffle-plates,” however ingenious; but we give the section of it for our readers to judge. As

an outlet-ventilator, however, the flap seems likely to fulfil its purpose of letting out air and at the same time preventing back-draught better than the mica ones.

NOTTINGHAM CASTLE.—The Castle, now used (as our readers will remember) as a museum, is being fitted up with heating apparatus, the “Beeston Radiators” being the apparatus adopted. Messrs. Danks & Co., of Nottingham, are the contractors for the work.

TELEGRAPHIC ADDRESSES.—A new supplement to Sell's Directory of Registered Telegraphic Addresses has been issued, in sending which Mr. Sell asks us to state that he has the permission of the Postmaster-General to state the trade or profession of firms in the alphabetical lists, and will add this information in the next edition if firms will give him the requisite information.

THE PARIS 1900 EXHIBITION.—M. Bouvard, the directing architect to the Exhibition, has had prepared a bird's-eye view showing the Esplanade des Invalides as it is to be after the Exhibition, when it is to be, so to speak, returned to the Parisians with new embellishments of trees, sculpture, parterres of flowers, and a monumental fountain, the whole forming a kind of continuation of the Champs Elysées beyond the new bridge which will be formed across the Seine.

SURVEYORSHIP, BURNLEY, LANCASHIRE.—At the monthly meeting of the Burnley Town Council on the 3rd inst., a lengthy discussion took place on the recommendation of the joint meeting of the Improvement and Highways and Sewage Commissions to appoint Mr. G. H. Piesse, Borough Surveyor, at a salary of £500 a year, and to appoint Mr. Button, the retiring Surveyor, Consulting Engineer, at a salary of 100 guineas per annum. After several amendments had been defeated, the recommendation was agreed to. Alderman Baron then submitted a further resolution, to the effect that in accepting the resignation of Mr. F. S. Button, a member of the Institute of Civil Engineers, of his office of Borough Surveyor of Burnley, the Council desire to place on record their high appreciation of the valuable services Mr. Button has rendered to the Corporation, and to acknowledge the courtesy shown by him to the members of the Council and others during the 7½ years he has held such office. Alderman Burrows seconded, and the resolution was carried unanimously.

MEMORIAL WINDOW, EAST BUDLEIGH CHURCH.—A stained glass window has been placed in the church of East Budleigh, commemorating the laying of the first telegraph cable between this country and America. The subject chosen for illustration is a “Christ stilling the tempest.” The window is the work of Mr. F. Drake, of Exeter.

CITY COMMISSION OF SEWERS.—On Tuesday a meeting of the City Commission of Sewers was held at the Guildhall, Mr. H. T. Gordon presiding. A deputation of merchants and traders in the vicinity of St. Martin's-le-Grand attended with a memorial drawing the serious noise and odour emanating from the grave necessity for abating certain noxious emanations from the General Post Office, which had prevailed for some years past to the detriment of the public health and comfort. Dr. Sedgwick Saunders, the Medical Officer of Health, said there was nothing in the sewers or gullies to account for the effluvia, which was doubtless caused by the burning down of hot coal and coke in the machinery department of the Post Office. On the motion of Mr. Deputy Pepler, the memorial was referred to the Sanitary Committee to take such immediate action as they might be advised to prevent the continuance of the nuisance. The Streets Committee reported that the additional cost of carrying on the repaving of Fenchurch-street, Mansion House-street, Poultry, Liverpool-street, and Upper Thames-street, by working during daylight with two shifts of men of eight hours each, between 4 a.m. and 3 p.m., was estimated at 1,257l. The accepted tender for working during the ordinary hours, from 6 a.m. to 6 p.m., with intervals for meals, was 2,476l. The saving of time, if the additional expense was incurred, by working in two shifts, would be from five to six days. Mr. Deputy White moved that the work should be done in the ordinary hours, and for the amount of the original tender, and this, after a debate, was carried by a majority of two votes. It was decided to refund 3,000l., with interest, being the sum deposited by the City of London Electric Lighting Company for the due fulfilment of their contracts for lighting the City by electricity.

NEW RAILWAYS IN THE NORTH OF FRANCE.—A large new railway system (“reseau,” as the French call it) is to be carried to serve the district of the Côtes du Nord. The cost will probably be about 23 million francs. Several of the projected lines, especially that from Brice to Portrieux, and from Plancœt to St. Cast, will go through very beautiful country, and are likely to become popular travelling routes.

PUBLIC LATRINES IN PARIS.—Subterranean retiring-rooms are shortly to be constructed at various points in Paris, on the model of those in London. The first will be constructed at the Place de la Bastille and the Boulevard Magenta.

THE “SELF-LIGHTING GAS-BURNER.”—A few days ago we inspected one of the most remarkable inventions of modern times. It is now possible by turning on the tap of a gas-jet to cause the gas to

light itself—without the aid of a “by-pass,” and without applying a lighted match, or taper, or by electricity. The invention is known as “Duke's Self-lighting Gas-burner,” and certainly deserves its name. Briefly, the gas is lighted by taking advantage of the well-known property of platinum to cause the combination of hydrogen with oxygen, whereby heat is developed sufficient, in the adaptation employed, to light a stream of gas issuing from the burner. The work is accomplished by a purely chemical process. Attached to an ordinary governor-burner is a small metal tube, at the summit of which is a plug of porous refractory material. In the “pores” of this platinum black has been deposited; and the top of the plug is almost in a line with the top of the burner. From the centre of the plug springs a piece of twisted platinum wire, bent over in the direction of the orifice of the burner, and almost touching the latter. When the gas is turned on, it finds its way to the “platinum black” which rapidly becomes incandescent and communicates its heat to the platinum wire; in its turn the latter gets white-hot and the stream of gas is ignited—the whole operation occupying from three to six seconds. The practical applications of this invention are innumerable. In the first place, it changes the “by-pass” and it will have its effect on the match industry. In regard to its connexion with the incandescent light the invention cannot, in its present form altogether do away with the “by-pass,” as the few seconds that elapse between turning on the gas and its lighting are enough to allow the escape of gas sufficient to mutilate the film by exposure. But it does away with the “by-pass” “pseudo by-pass” which ignites the gas when the latter is turned full on. Like a number of other useful inventions, however, it has been introduced to the market before the proper time—before the invention was completed. Useful as it is, we have no hesitation in saying that it is doomed to immediate extinction. But it is a change in the way in which a task takes place. The public is interested enough to purchase (for the modest sum of half-a-crown) one of these burners as a trial, but the sale would soon fall off if, after lighting a few times, the thing was found to fail. We will point out a few defects that occurred to us to require remedying as we looked at the burner. In the first place, “platinum black,” as is perfectly well-known to chemists, is a very short “life”; the inventor's representatives told us that it would last as long as the burner, which is not saying much for the burner. If the inventor has discovered a means of prolonging that life other than by the method of causing the deposition of the platinum in the refractory porous substance alluded to—the nature of which we do not know “secret”—we failed to elicit the fact; and we decline to believe that the life of the black is materially increased by its method of introduction. That is an important point, but is insignificant compared with our next objection. The gas is ignited eventually by the platinum wire becoming incandescent; we have no objection to this, but we notice that wire was most carefully adjusted in a certain position with reference to the orifice of the burner, the gas would not ignite. Now nothing could be much more pliable than platinum wire, and nothing could be easier than for a servant in dusting, say a chandelier to cause a slight displacement of the wire. In dusting a burner home a single touch would become deranged. True, it is not at all difficult to re-adjust the wire, but that is not the point. Matches are cheap enough, and rather than “tamper with the gas,” nine people out of ten would prefer to light it in the ordinary way. Another matter, respecting which the inventor will have to satisfy us, is the practical working of his device, is as to the effect of dust in impairing the access of the gas to the platinum black. In certain situations, no doubt, dirt would be burnt up with each lighting, but all dust could not be disposed of in that way. Any retardation in lighting after the gas had been turned on might lead to serious consequences, to say nothing of the offensive odour emitted under even favourable conditions. In short, we believe this invention has a future; but it will have to be considerably modified before it altogether passes out of the range of “scientific toys.”

LEGAL.

PARTY WALLS AND THE LONDON BUILDING ACT, 1894.

DISAGREEMENT OF THE JUDGES.

THE case of *Crow v. Redhouse* came before Justice Wills and Wright in the Queen's Bench Division, on the 4th inst., for judgment, it being a special case stated by Mr. Dickinson, a Metropolitan magistrate, on an appeal by *Redhouse*, under Section 150 of the London Building Act, 1894, against a decision by Mr. Arthur Crow, a District Surveyor of the Whitechapel Spitalfields district. Section 150 of the Act in question provides that, when it appears from the building notice served on the District Surveyor that it is proposed to erect any building, or to make any contrivance for the use of the building, the District Surveyor shall serve upon the builder, or building owner, a notice of objection, and it gives an appeal to a magistrate from this notice.

The facts of the case are shortly as follows:—Mr.

1. Buxley Health, Reversion in 90 yrs., 1887.

TIMBER.		TIMBER (continued).	
Greenheart, B.G.	8 1/2 lb	Stett. Porto Rico	6 1/2 lb
Teak, E.I. L.	10 1/2 lb	Walnut, Italian...	10 3/4 lb
Sesquid, U.S. Can.	2 1/2 lb		
Black, do.	10 1/2 lb		
Birch, do.	3 1/2 lb		
Elm, do.	3 1/2 lb		
Oak, do.	3 1/2 lb		
Pin, Canada	6 1/2 lb		
Do. Yellow	5 1/2 lb		
Do. White, Pk. int.	5 1/2 lb		
St. Petersburg.	5 1/2 lb		
Walnut, Rica.	8 1/2 lb		
W. Pine, do.	3 1/2 lb		
Osage, crown...	3 1/2 lb		
Do. and 1st std	7 1/2 lb		
Do. 2nd & 3rd	7 1/2 lb		
Do. 4th & 5th	7 1/2 lb		
St. Petersburg.	5 1/2 lb		
2nd yellow	9 1/2 lb		
Do. 1st yellow	9 1/2 lb		
Do. white	9 1/2 lb		
Do. 2nd yellow	9 1/2 lb		
White Sea	7 1/2 lb		
Canada, Pine 1st	8 1/2 lb		
Do. 2nd	8 1/2 lb		
Do. 3rd & 4th	8 1/2 lb		
Do. Spruce, 1st	8 1/2 lb		
Do. 2nd	6 1/2 lb		
Do. 3rd	6 1/2 lb		
Do. 4th	6 1/2 lb		
Do. 5th	6 1/2 lb		
Do. 6th	6 1/2 lb		
Do. 7th	6 1/2 lb		
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Do. 99th	6 1/2 lb		
Do. 100th	6 1/2 lb		

J. Bradburn & Sons	£356	E. & A. Frith, Catherine-	
G. Roylance & Co., Ltd....	328	street, Macclesfield*	£243
Gorton & Wilson	287	* Accepted.	

MELKSHAM.—For the erection of four semi-detached villa residences, for the Melkham Dwellings Co., Ltd., from plans and specifications supplied by Mr. E. Gunstone, surveyor:—
Davis & Sons.....£1,100 0 Bigwood & Co.*.....£1,663 15
Linsay.....1,485 0 * Accepted.

NEW SHOREHAM (Sussex).—For additions to school buildings, for the School Board. Messrs. Loader & Long, architects, 54, Old Steine, Brighton. Quantities by the architects:—
Saunders & Son.....£2,754 0 Field & Co.£1,515 5
Roeke.....1,750 0 Watson.....1,200 0
Taylor.....1,560 0 Peters & Son.....1,475 0
Jackson & Co.1,638 0 Gilham.....1,450 0
Cooke & Son.....1,575 0 Cudd, Shoreham*.....1,375 0
* Accepted.

PAIGNTON (Devon).—For the erection of a Wesleyan chapel, Palace-avenue. Messrs. W. G. Coudrey and J. S. Bridgman, joint architects, Paignton. Quantities by Mr. V. G. Brown, Paignton:—
Webster & Maunders.....£2,770 15 0 M. Bridgman.....£2,015 14 6
T. Webster & Sons.....2,279 10 0 E. P. Bowe.....1,995 0 0
C. & R. F. Drew.....2,185 0 0 L. Blitchford.....1,900 0 0
H. F. Rabich.....2,165 0 0 Upton, Torquay.....1,991 12 0
R. F. Yeo.....2,014 0 0 J. H. Lamacott.....1,893 10 0
* Accepted.

PAIGNTON.—For erecting boundary wall and gate piers at the Public Park, for the Paignton Urban District Council. Mr. J. Stanfield-Bruce, C.E., Town Surveyor. Quantities by Mr. Vincent Cattermole Brown, of Paignton:—
G. Webber.....£1,195 0 0 M. Bridgman*.....£1,178 19 4
K. Harris.....184 10 0 * Accepted.
Surveyor's estimate, £184.

PICKERING (Yorks).—For the execution of water-supply works, Lewisham, for the Rural District Council. Mr. Geo. Harrison, Engineer, 39, North Street, Darlington. Quantities by Messrs. Brown & Sons, Whitby.....£2,350 10 0

RICHMOND (Surrey).—For the erection of court-house, &c., for the Corporation. Mr. W. J. Ansell, architect, 3, Stapleham, W.C. Quantities by Mr. T. J. Carless, 35, Old Queen-street, Westminster:—
Kirk & Randall.....£2,565 10 0 Thos. White.....£3,474 0 0
Kellett.....2,647 0 0 J. W. Brooking.....2,397 0 0
C. Gordon & Sons.....2,148 0 0 R. E. Nightingale.....2,377 0 0
Geo. Wade.....2,551 0 0

RICHMOND.—For repairs and alterations to No. 7, Coverdale. Mr. E. Pennington, surveyor, Richmond.....£1,102 10 0
Lillywhite.....£1,102 10 0 (Seal & Co. accepted).....£1,102 10 0

SALISBURY.—For pulling down and rebuilding the business premises known as New Sarum House, Market-place, Salisbury, for Messrs. Mann & Co. Mr. Fred Bath, architect, Crown Chambers, Salisbury. Quantities by the architect:—

	Whole of work.	Deductions.	Amended Tender.
Belham & Co.	£6,078 3 7	£6,454 15 3	£5,513 8 4
Webb & Co.	6,168 0 0	602 19 3	5,565 8 9
Kellow & Smith.....	5,950 0 0	481 10 0	5,468 10 0
G. H. Wilkins.....	5,848 0 0	402 0 0	5,446 0 0
Vincent & Folland.....	5,550 0 0	493 12 0	5,056 8 0
Jenkins & Sons, Bourne-mouth*.....	5,536 0 0	1,128 0 0	4,408 0 0

* Accepted subject to a slight modification.

SHANKLIN (I. of W.).—For the supply of 1,410 yards, c.-i. water-pipes, for the Urban District Council. Mr. Lewis Coleman, Engineer, Shanklin:—

	Per ton for pipes.	Per cwt. for fittings.
Cochrane & Co.	£ 8 d.	8 d.
Clay Cross Co.	3 10 0	9 0
Stanton Iron Works.....	7 6 0	8 6
J. Oakes & Co.	5 0 0	11 0
Winstone & Co.	5 0 0	9 3
Thames Bank Iron Co.	3 9 0	3 0
J. Gibb & Co.	5 0 0	6 6
F. Cantello.....	4 19 6	9 7
H. W. Dawes & Co.	4 18 6	9 0
Monner-Williams & Co.	4 18 0	9 0
C. Jordan (Executives).....	4 18 0	9 0
R. W. Brett.....	4 18 0	9 0
J. R. Chee.....	4 17 6	9 0
A. Appleby.....	4 17 0	9 0
Watson, Gow, & Co.	4 15 0	9 0
R. Laidlaw & Co.	4 14 0	8 6
Burley Iron Works.....	4 14 0	8 6
Shaw & M'Jones.....	4 14 0	8 6
H. J. Skelton & Co.	4 13 11	8 3
Macfarlane, Strang, & Co.	4 13 6	9 0
Maclean & Co.	4 12 0	8 0
I. Abbot & Co., Gateshead*.....	4 7 6	8 0

* Accepted.

ST. ALBANS (Herts.).—For the execution of road-works, Lemsford-road, for the Corporation. Mr. George Ford, City Surveyor, Victoria-street, St. Albans:—
James Dickson.....£153 10 0 George Capper, St. Alban's*.....£130 0 0
* Accepted.

SHOEBURNESS (Essex).—For the erection of three pairs of semi-detached cottages, for Miss Knapping. Messrs. Burla & Harris, architects, Clarence-street, Southend-on-Sea:—
W. Howard.....£1,063 7 0 Alp. & Venturi.....£1,060 4 6
A. Woodhouse.....1,047 10 0 Shoeburyness*.....£1,060 4 6
J. Bullock.....1,039 3 0 * Accepted.

SLAITHWAITE (Yorks.).—For the construction of main sewers (1,500 yards), for the Urban District Council. Messrs. Abbey & Hanson, C.E., 7, Ramsden-street, Huddersfield:—
Elthridge & Clark, Moss Bank, Creeton Hill, Manchester.....£1,671 18 4

TIPTON (Staffs.).—Accepted for additions to Burnt Tree school buildings, for the School Board. Mr. Alfred Long, architect, 319, High-street, West Bromwich:—
C. A. Horton, Beasley Hill.....£988

TWICKENHAM.—Accepted for repairs and alterations to No. 8, Manor-road. Mr. E. Pennington, surveyor, Richmond:—
Seal & Co., Richmond.....£1,108

WRITTLE (Essex).—Accepted for additions to school buildings, for the School Board. Mr. Frank Whitmore, architect, 47, Duke-street, Chelmsford:—
Henry Kennel, Writtle.....£391
[Two other tenders received.]

TO CORRESPONDENTS.

G. F.-M. & F.-W. H. H.-B. R.-J. A. (amounts should have been stated).—H. W. W. (below our limit).—R. D. (too late: next week).

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GLASGOW:
47 and 49, ST. ENOCH-SQUARE.

The Builder.

VOL. LXIX. No. 2777.

JULY 27, 1895

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 Halifax Bask Competition: First premiated design.—Messrs. Horsfall and Williams, Architects.....*Double-Page Photo-Litho.*
 Home for the Dying.—Messrs. Young and Hall, Architects.....*Double-Page Photo-Litho.*
 Sculpture: "Destiny"—Mr. A. C. Lucchesi, Sculptor. "Faith": Relief.—Mr. A. Drury, Sculptor.....*Two Single-Page Ink-Photo's.*

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Copyright in Designs.



WE may say at once that the book, the title of which stands at the foot of this article* is excellently done. It is clear, concise, and yet sufficiently full to be of practical service to all interested in this subject. We do not propose to say more in the way of criticism, but we cannot let the issue of this work pass without some remarks of a general character on the law which relates to copyright in designs. Like the subject of patents for inventions, it becomes—with the increase of ingenuity in mankind, with the greater demand on all kinds for comforts and conveniences—of ever increasing importance year by year. The subject is now altogether governed by that portion of the Patents, Designs, and Trades Marks Act, 1883, which relates to designs and by the rules made under that Act. This statute consolidated and completed the statute law, which had its beginning in the year 1787, before that date "the inventor of a design had no means of acquiring any property therein, or of preventing others from imitating his design, except that he might then, as he now in some cases, obtain protection by grant of a patent for an invention."

In the year which we have just named the increase of mechanical industries in Great Britain led to an Act of Parliament, which gave a copyright to inventors of designs for iron, steel, cottons, calicoes, and muslins. Two points are remarkable about this early legislation—namely, the special character of the industries with which the statute dealt, and the very short time for which protection was given. The term was only two months, though, by an Act passed in 1794, the term was extended to three months. The next noticeable landmark in the history of this special legislation occurs in the year 1842. An Act was passed in that year which put an end to all previous legislation, and contained within its provisions the law upon this subject. This statute gave copyright to any new

and original design; whether such design was applicable to the ornamenting of any article of manufacture, or by whatever means such design was so applicable. The operation of the Act was to enlarge the scope of protection, though it had, in one sense, a serious defect. This arose from the fact that the term of copyright depended upon the class of goods to which the design was applicable. These terms were three, nine, or twelve months. The object of these singularly minute differences is now a matter of no practical interest, but they are noticeable as showing the somewhat grudging manner in which the Legislature gave protection to the designer. We pass over intermediate and amending Acts, by which, in some instances, the term of protection was extended to three years, until we reach the important statute of 1883. The Act, in addition to being a consolidating statute, was also one of an amending character, but perhaps its most important practical feature was that the term of protection was extended to five years. It is doubtful if this period is likely to be extended; it has remained in operation for twelve years; it gives a designer a reasonable time in which to obtain profits from his ingenuity or his skill, and yet it does not extend over such a length of years as to keep the price of good designs at a high level to the detriment of the public for a long period. It appears to be a reasonable mean, protective on the one hand of the mental property of a designer, and on the other hand not prohibitive of a free circulation of the effects of an invention.

Such then being the period for which a design can be protected, the next point which naturally suggests itself is what is a "design" within the meaning of the existing ruling statute. It is scarcely profitable to seek for working definitions in a dictionary. If we take the two which are to be found in Johnson's Dictionary (Latham edition, 1866), which are cited among others by the author of this work, we find them to be: "1. Intention, purpose, scheme, plan of action; 2. Idea which an artist endeavours to execute." Neither one nor the other of these is of the least assistance in the present instance. When we look to the Act for a definition, we find one nominally, but which is not one in fact. "In and for the purposes of the Act," it says, "design means any design applicable to any article of manufacture, or to any

substance, artificial or natural, or partly artificial and partly natural, whether the design is applicable for the pattern or for the shape or configuration, or for the ornament thereof, or for any two or more of such purposes, and to whatever means it is applicable." It then goes on to state various means by which it may be so applicable, as by printing, painting, and so forth. These it is unnecessary to specify. But it is obvious that the above leaves open the true definition of a design. It is, in fact, of the same nature as the well-worn joke that an archdeacon is a person who exercises archidiaconal functions. It is no more than a limitation of the word "design" after the person who is considering the statute has decided in his own mind what that meaning is. The fact is that every case must be judged according to its circumstances. It must be examined in all its bearings, and if it comes to a judicial decision, that decision must be based on a consideration of the circumstances, so as to ascertain whether what is alleged to be a design is one in fact. The consequence is that decisions are not always in harmony, and that the result must as a rule be arrived at by a process of negative reasoning. A design works out generally, to be a representation which can be reproduced in some form or other as a mere representation: it must not be a mechanical contrivance or principle, nor a process of manufacture. In fact, the chief difficulty in these cases is to differentiate between a patent for an invention and a copyright for a design. This may be exemplified by a comparatively recent decision. The design then registered was for a picture of a basket; underneath it was the statement, "claim for pattern of a basket, consisting in the osiers being worked in singly and all the butt ends being outside." It was held by the Court that "the plaintiff had registered a process or mode of manufacture and not a design." In giving judgment Mr. Justice Vaughan Williams remarked: "The design within the terms of that definition must be capable of an existence outside the article itself altogether. It must be something that one can apprehend, and something which, if one has it presented to one's eyes, one can see externally to the article to which it is to be applied." In other words, "it must be something which is capable of existence as a pattern, or as a shape or configuration, or as a piece of orna-

*The Law of Copyright in Designs," by Lewis and, Esq., Barrister-at-Law. London: Sweet & Well. 1895.

mentation to be applied to an article or class of articles."

It is obvious, then, that the dividing line between a copyright for a design and a patent for an invention must often be obscure, since the invention has to be described, and it may well be that the public cannot always distinguish between the two above mentioned things. The present state of this matter is very English and rather tends to litigation: we are not a nation which is given to clear definitions and to scientific legal codes, and it is quite in accordance with our habits to leave the public and the judges, if a dispute arises, to formulate for themselves in each case whether a certain thing is or is not a design. If the matter under consideration is a design, then it can be protected for the short term which we have already mentioned and at a small cost, provided it be novel and has not been published, that is to say "exhibited or publicly used." On these points great light is thrown by the decisions which have been given from time to time, not only on copyrights for designs but on patents for inventions. The principles are the same in each decision. Here especially we have to regard each separate fact in relation to the point under discussion. Thus, to take one example from many, a man worked out a design for a gas chandelier, and placed it, before registration, in the hands of his travellers, who took it about to show the customers of the designer, with a view to obtain orders for it when it had been registered. It was held that there had been a publication prior to registration, which prevented the design from being a new one. This was a plain and a straightforward case, but it indicates clearly the very varying sets of circumstances which necessarily have to be considered in regard to a design as much as in regard to an invention when novelty is claimed for it. It exemplifies also the caution which must be exercised by designers, who wish to obtain legislative protection for their discovery or invention, call it what you will, not to allow it to get in any way into circulation before it is registered. No doubt, in the case to which we have just referred, there was an idea of discovering the practical value set upon the design before the expense of registering it was incurred; but this sort of thing will not do, there must be absolute novelty in a design in order to obtain the protection which the act of registering grants to it for a limited period of time.

SCULPTURE AT THE ROYAL ACADEMY.

THER claims on our space have obliged us to defer till now our usual notice of the sculpture at the Royal Academy, which, it must be confessed, does not, on the whole, make a very striking show this year, and even as it is the Academy seems to have had difficulty in filling the room to their satisfaction, as we observed that one or two corner spaces on the walls, which are generally occupied by small works, are empty this year. It can hardly be said that any one of the principal sculpture exhibits can be described as a great work, but there are several which are of more than common interest, both in regard to subject and execution.

There seems to be a certain tendency among some of our ablest sculptors of late to regard beauty of form, especially in treating the nude figure, as secondary to the illustration of a special sentiment: a somewhat hazardous line to take in sculpture. We seem to recognise this tendency, in different ways, in at least four of the principal works which are exhibited in the Lecture Room. Mr. Onslow Ford's bronze figure, "Echo," for example, has little of the beauty of the nude figure. "Echo" is represented as a thin, bony female stretching up her arms, and with a general expression of lassitude and hopelessness. This we may suppose represents "Echo" as the nymph, not a symbolisa-

tion of echo as an acoustic phenomenon. The figure is very carefully studied, and expresses the sentiment of hopelessness and weariness which is probably intended to be conveyed, but one cannot avoid the reflection that there could be no wonder that this Echo should have pined in vain for Narcissus. Mr. Lucchesi's "Destiny," in the opposite angle of the room, shows more of physical grace than Mr. Ford's figure; still one feels here that physical beauty has not been a primary object in the work; the object is the expression of a sentiment; though in this case there is sufficient of beauty in the figure to give an added charm to a work which is very poetic in feeling. We give an illustration of this (see lithograph); unfortunately the front-view photograph, the only one attainable, does not convey properly the expression of the face; a side view would have done more justice to the work.

Mr. Thornycroft's figure, entitled "The Joy of Life," which occupies a prominent position at one end of the room, represents a young woman realistically clothed in short skirts, shoes, and stockings, executing a vigorous dance with one knee raised; the work is no doubt a great success in its display of energetic action, but it is to our thinking totally unsculpturesque in character, and one must regret to see a sculptor whose works have hitherto shown such purely artistic

convictions in regard to his art, attaching his name to this bit of sensationalism. Mr. Bertram Mackennal's figure, with the title, "For She Sitteth on a Seat in the High Places of the City," is a quasi-moral subject, and one of considerable power; a nude female, with an insolent expression on her upturned face, is seated in a chair which is decorated with various symbolic devices; a figure of a winged boy lies beneath her feet as if overthrown by her. The triumph of Vice is obviously the meaning of the composition, and the meaning is plainly and powerfully expressed, but we cannot admire the work in a decorative sense. The straightforward seated position, with the knees parallel and the feet rather drawn back, is one of the least effective positions in which the nude figure can be treated in sculpture; the effect of the tapering lines of the limbs is lost, the figure assumes a comparatively square and massed form, and in that respect the lower part of the figure inevitably wants breadth and mass to balance the upper portion; a seated figure in this position almost requires drapery over the knees to give breadth of surface, and to mask the rather ungainly angular lines formed by the legs in this position. We believe the feeling of most spectators will be that this is an expressive but an ungainly group.

In the centre of the Lecture Room we have



"Mother and Child": Group by Mr. Paul R. Montford.



"Guardian Angel": Relief. By Miss E. M. Rope.

Goscombe John's very clever and spirited study of a "Boy at Play," who is supping himself on one foot planted behind body, while he stretches out the other to with his toes some object on the ground re him. As a study of action and pose, boy's figure this is a very clever work, it is an ugly one, and the face is of a and common type; and it may surely be asked, if the study of a boy's figure in on, simply for its own sake and without ideal meaning attached to the work, is representation in sculpture (and we admit that it is), why not at least give a noble type of boy instead of a mean unpleasing one? We had included this as one for illustration, on account of the ty displayed in it, but its appearance in graph (partly perhaps from a bad posing chosen) was so unpleasing that preferred to abandon it.

Mr. Pegram's figure of "The Bather" is ally a simple study of action and pose in nude figure, an excuse being given for a ial action of the figure by the intro- tion of a mermaid on the base who has ght the intending bather by the foot. re is something a little absurd in this, e the work is totally devoid of any of sentiment which should attach to a ndary incident of this kind, but as a re study it is a good one, and while vings less individuality than Mr. Goscombe's work just noticed, is certainly more sing. Mr. Paul Montford's group of her and child, facing Mr. Thornycroft's re at the opposite end of the room, puts sculptor on a higher level than he has iously attained. The general character e work is indicated in the accompanying aving; this is a subject of real life, but treated in a truly sculptural manner; e the action both of mother and child, atural and life-like, the group has ient repose for sculpture, and the ern type of dress is treated in a broad effective manner.

In the central hall we find what may be ed the most important work of the year, Fehr's "Hypnos bestowing Sleep on the h." Here we have fine composition, picturesque character, and the expression poetic ideal. The god of Sleep, a nude

figure with great wings extended behind and upwards, stands on a pedestal around which are sculptured child figures, in bas-relief, expressive of sleep. This pedestal is one of the best portions of the work, and is a fine piece of subordinate design. The large wings of the main figure are very effective, and are no doubt much better suited for execution in bronze than such a feature would be in marble, but it must be admitted that they overweight the figure seriously, and this would appear still more if the group were placed in the centre of the floor; it is perhaps owing to a perception of this that it has been given a side position against the wall. The other principal work in the Central Hall is Mr. Drury's relief composition entitled "Faith," of which we give a lithograph illustration; it represents, as will be seen, the sacrifice of Isaac, with an angelic figure personifying the Divine command. The figure of Abraham detaches itself effectively from the background; the details are all very carefully treated, and the whole composition is decorative in effect, but we fear the angelic head must be considered rather weak in expression.

Of the smaller works of the year unquestionably the most remarkable is Mr. Swan's group in silver, "Orpheus," a kind of translation from his picture, only that here Orpheus is on a rocky pedestal up which one of the animals climbs; another lies rolling under his feet. While we utterly refuse to accept a naked prancing youth as an ideal of Orpheus, the treatment of the subject is much better suited to a silver statuette than to a picture on a large scale. Mr. G. J. Frampton's "Mother and Child" is a bronze group representing the half-figure of the mother holding an infant whose form and substance are lost beneath a stiff brocaded frock with a great deal of surface detail on it; the mother's thin face is expressive but is rather over-weighted by the thick masses of luxuriant hair—more suited for pictorial than sculptural treatment. A white ground behind, in a dished circular form, makes a kind of nimbus behind the mother. This is an effective work in a decorative sense, but too artificial for our liking.

Mr. Pomeroy exhibits his small-scale study for the frieze for Sheffield Town Hall, one portion of which, in its completed state, we illustrated last week. The model effectively

illustrates the advantage of the method which Mr. Pomeroy has recommended for plaster modelling of a bas-relief, of working down from the top surface instead of building up to it. Among other works in relief may be named Mr. Wood's "Circe," which, besides being a well-executed work, exhibits some originality of conception; Miss Rope's "Guardian Angel," of which we give an illustration; Mr. G. Frampton's "Music and Dancing," low-relief panels in silver for the doors of a cabinet, and the same artist's gold medal for Glasgow University, which is not a commonplace medal, and compares advantageously with some other exhibited medals, which are very commonplace.

Among the busts, which, as usual, are numerous, are some which exhibit special excellence. Among these are Mr. Onslow Ford's bronze portrait busts of Mr. Orchardson and Mr. Briton Riviere, which are not only fine examples of portraits, but are of some interest for their simple architectural treatment of the design of the pedestals. In the treatment of the support of a bust, and in the transition from the bust to the decorative base, there is room for a great deal of variety and inventiveness of design, and Mr. Ford has before shown, in his treatment of busts, that he does not neglect this decorative element, in which he has made some new suggestions. Among other busts to be looked at are Mr. Fehr's "Meditation," Mr. Armstead's portrait of Mr. Augustus Morgan, Mr. Dressler's "Sir John d'Urberville, an ancestor of Tess," and Miss Dabbs's "Sweet Seventeen."

Some purely decorative works are found among the sculpture, such as ought to find place in the room dedicated to "Architecture and the Allied Arts" which we wish to see. Among these Miss Esther Moore's "Sketch Design for a Clasp" is effective and original, and the "Casket in Steel and Enamel," by Nelson and Edith B. Dawson, is an object with a distinct and picturesque character of its own.

NOTES.

ON Friday afternoon last week Mr. D. G. Hogarth gave a very interesting lecture at the rooms of the Royal Society on the excavations at Deir el Bahari (or Dér el Bahri), to which we referred in our last issue. The lecture was illustrated by a number of photographs displayed on a screen by a lantern, showing all stages of the excavations, and amply justifying the claim that a really important and arduous piece of work had been accomplished at this site by the Egypt Exploration Fund. In the course of the lecture Mr. Hogarth touched on the subject of the Egyptian origin of Greek architecture, and questioned the acceptance of the "proto-Doric" columns of this site and of Beni-Hasan, as the early form of the Greek Doric column. He suggested that, after all, any people wishing to cut down a square pier into a somewhat lighter and more expressive architectural form would be likely to proceed in much the same way, by cutting off the angles and reducing it to an octagon, and then farther cutting it down to a sixteen-sided shaft, and that without any other detail this was scarcely a sufficiently distinctive form to regard as the origin of a style. This is certainly a point to be considered, and we may add that some further weight is given to it by the fact, on which we have already commented, that the Beni-Hasan columns, which are much earlier than those of Deir el Bahari, have rather more resemblance to a Doric column than the latter, especially in regard to the proportions of the abacus. It must also be admitted that the interval between these plain sixteen-sided props with a simple abacus, and even the earliest form of Doric column, is a very large one, and that we are without any intermediate link whatever in regard to the characteristic details of the Doric column. On the other hand, it is significant that the earliest Doric columns have sixteen flutes,

* For this we were not responsible.

which seems to connect them to a certain extent with the sixteen-sided column of Egypt. We have often thought, however, that the degree of historic relation between Egyptian and Greek art has been exaggerated, and Mr. Hogarth was quite justified in raising the question. The remark that "these columns" (of Deir el Bahari) "have not the base which characterises the Doric column," was we presume due to a slip of the tongue, and the lecturer must have meant something different from what he actually said. Otherwise, the lecture was delivered with admirable clearness and fluency, and listened to with great attention by a crowded audience. Dr. A. S. Murray occupied the chair.

SINCE our last report on Delphi the excavations have yielded further substantial results. M. Homolle is at work on the theatre, about a third of which has been laid bare. The principal find at present has been in the orchestra, where a large number of fragments of a frieze have come to light. The material is white marble, the height 0.8 metres, and the subject the labours of Herakles. The subjects already found are the horses of Diomedes, the giant Anteus, the Centaurs, the Stymphalian birds, and the freeing of Hesione from the sea-monster. It is almost certain that this frieze decorated the *proscenium*. The whole structure of the theatre is much better preserved than had been anticipated, and the walls are in part covered with inscriptions. The excavators are now in search of the Lesche of Polygnotus, which so far eludes them, but in the course of the search important remains of the "Mycenæ" period have come to light, and to the north-east of the temple fragments of large sculptured groups of archaic style, one representing a lion slaying a bull; also other fragments of a group of poros stone painted, and which evidently formed part of a pediment composition.

THE Report of the Liverpool Medical Officer (Dr. Hope) on the health of Liverpool during the year 1894, contains some information on the procedure of the authorities in regard to some insanitary property of an exceptional kind, consisting of a number of houses situated in two areas, at the north and the south of the city. The total number of houses included in these areas was 577, and they mostly consist of three rooms placed one above the other, connected by staircases leading directly from one room to the other without any intermediate landing, so that the same atmosphere pervades all three rooms; the houses are back to back and side to side with others of similar structure; there is no yard space, nor water-closet private to each house, and no water supply direct to each house, the supply being by standpipes in the court. The houses are arranged in courts, the entrances to which are narrowed, or even converted into tunnels, by the contiguous street houses. During the years 1892 and 1893, no less than 851 notices were issued from the Sanitary Department to the owners of the property in question to cause the abatement of nuisances, more or less flagrant, such as choked and defective drains, defective closet seats and doors, dangerous cellar areas, dangerous roofs, defective and dangerous flags, &c. In connexion with these facts it is noticeable that in three contiguous streets the average death-rate is 63.1, 67.0, and 71.4. It is satisfactory to find that, on the Medical Officer's report, "the Grand Jury concurred in his view that the houses in question were unfit for human habitation and ought to be demolished," though we do not learn that this has yet been actually carried out. The facts as to the health of the streets in question ought to be noted by those Rip Van Winkles of sanitation who still defend the building of back-to-back houses.

THE twentieth annual Dairy Show to be held at the Agricultural Hall on Oct. 8 and the three following days, under the

management of the British Dairy Farmers' Association, promises to have a certain special interest for architects in regard to the practical planning and construction of dairies. Sir James Blyth has offered prizes to the value of 400*l.* for the best plans and models of dairies. The names of the judges are not yet published, but it is announced that an architect, Mr. W. D. Caröe, will be one of them. Designs for five classes of buildings are invited, for three of which premiums of 60*l.*, 30*l.*, and 10*l.* will be awarded, and for the other two premiums of 25*l.*, 15*l.*, and 10*l.* Particulars can be obtained from Mr. W. C. Young, the Secretary, 12, Hanover-square, up to September 9.

IN this country a little progress has been made in electric traction by underground and overhead railways, but we are a long way behind the rest of Europe in its adoption for ordinary street tramways. The reason for this is the opposition offered by many municipalities to overhead wires. The unsightly system so common in America of having transverse span-wires hung from poles on both sides of the street may have something to do with our prejudice, but a row of ornamental steel posts, which could also be used as standards for arc lamps, down the centre of a street and carrying a fairly thick wire on each side would not necessarily be ugly. As examples of successful trolley systems we may mention the line that crosses the piazza on which Milan Cathedral stands, the tramways at Vienna, Brussels, Hamburg, &c., and in this country the South Staffordshire Tramways running from Walsall to Darlaston. In Europe at least 70 per cent. of the electric tramways are worked on the overhead trolley system, the reason being, unfortunately, that the conduit or slot system costs three or four times as much to erect, and it is difficult to keep the groove free from wet and dirt. The accumulator system is still more expensive, owing to the heavy cost of maintenance of storage cells and their great weight. At Budapest there is a successful system of conduit tramways, and in this country there is the well-known one at Blackpool.

THE annual report by Dr. Orme Dudfield on the health and sanitary condition of the parish of St. Mary Abbot's, Kensington, which makes a volume of nearly 250 pages, contains a good deal of useful experience in regard to many points in local sanitary legislation. Among other things we may recommend to the attention of sanitary officers and members of vestries the notes in regard to collection of house refuse and treatment of stable refuse (pages 180 and 184). In regard to the latter subject we may quote Dr. Dudfield's experience as to the relative results of various ways of storing stable refuse:—

"The nuisance caused by the accumulation varies in degree according to the character of the receptacle in which the refuse is stored. When this is a well-paved and drained enclosure on the surface of the mews, consisting of a low curb carrying a moveable iron cage attached to the stable wall by hooks, so that air-currents may circulate through the refuse, removal, moreover, being at once easy and complete, there is little or no nuisance, either in storage, or in transference to the wagon, or in conveyance through the streets. Brick receptacles, above ground, are more or less objectionable, for they are seldom thoroughly cleared out, short straw and dung being left at the bottom. Nuisance is least when the bottom of such receptacles is on, or slightly above the level of the surface of the mews, and provision is made for allowing moisture to drain away. But when the bottom of the receptacle is below the surface of the mews, and even though nominal provision has been made for drainage, nuisance is considerable: rain enters and cannot escape, as the drain (if any) gets choked, the result being that the refuse rots, the receptacle becomes filthy, and the collector will not incur the defilement attending a perfect clearance.

All of the evils above described are intensified in a high degree when the receptacle is entirely underground, untrained, and covered with wooden flags. The rain enters the pit, and confinement of the organic matters causes heat with rapid putrefaction, the result being that, after a short detention, serious nuisance arises, to the great discomfort of persons

living in the vicinity. Were these pits cleared regularly, as required by the regulations, it would still be a cause of nuisance."

TWO historical properties are offered for sale. One is Gwydyr Castle, with half-a-mile distant from Llanrwst, formerly a seat of the Wynnes, which passed to the Duke of Ancaster, husband of Mary, daughter of Sir Richard Wynne, Bart. It then came to Peter, first Baron Gwydyr, who married Priscilla, Baroness of Willoughby de Eresby, sister and co-heir of the fourth Duke of Ancaster.* The castle had been originally built, at the foot of the Falcon Rock, in the sixteenth century, by John Wynne Meredith, whose ancient house was for long paramount in the district, having acquired the estates after the death of Howel Coytmore ab Gryffith. Howell's monument, with effigy, is in the Gwydyr Chapel, Llanrwst, built in 1633 by Sir Richard Wynne of Gwydyr, Treasurer to Queen Henrietta Maria. That chapel and the Gwydyr bridge were designed, reputedly, by Inigo Jones. The chapel is famed for five Wynne brasses (seventeenth century), four of them by Sylvanus Crewe, the fifth by William Vaughan, and the stone coffin of Prince Llywelyn ab Iorwerth, Llywelyn the Great, who married Joan, a daughter of King John, by Agat, daughter of Robert Ferrers, Earl of Derby, and was buried (1240) in the Cistercian Abbey he founded at Aberconway. The bridge crosses the Conway in three arches, the central arch being 60 ft. span. A Pasquin tells a singular story of its building for Sir John Wynne, of Upper Gwydyr, the antiquarian and collector, by John relating that Jones was an illiterate labourer who had been employed there in constructing a wooden bridge, and was heard foretell the downfall, which speedily ensued, of the wooden fabric. Pasquin adds that Sir John sent Jones to school and then to study in Italy.† Sir John built Upper Gwydyr, on the high ground above Gwydyr Castle, in 1604—it has since been pulled down, excepting the chapel; in 1811 most of the Castle was dismantled, and rebuilt, upon a smaller scale, in the same style. The other property is Conover Hall estate, five miles south of Shrewsbury, a manor of Royal demesne the eleventh century, and held by Roger Montgomery, the first Norman Earl of Shrewsbury, who died in 1094. In 1155 Henry III. gave it during his pleasure to his sister Joanna, wife of the above-named Llywelyn, who seems to have enjoyed it until Easter tide, 1231, though meanwhile her husband was in open rebellion, and he devastated the Marches from Brecknockshire to Montgomery. On the death of John, Earl of Chester, without male issue, in 1235, the King granted Conover to Henry de Hastings and his wife Ada, the Earl's sister: in 12 Edward I. John de Hastings granted it, together with the manor of Wolverhampton, to Robert Burnell, Bishop of Bath and Wells, who rebuilt Acton Burnel Castle; during the reigns of Henry VI.—Richard III. it belonged to the Lords Lovel. At Conover, in 1284, was held the Parliament which passed an Act for the relief of creditors known as the Statute of *Mercatoribus*, also as the Statute of Acton Burnel. It was the birthplace of Thomas Owen, Lord Chief Justice of the Common Pleas, whose monument (1575) with robed effigy is in the south aisle of the choir, Westminster Abbey. Owen built the present mansion, which stands on three sides of a quadrangle, and is, we read, the oldest of its kind in the county. The central portion of the main block was added by Inigo Jones—*teste* Neale's "Seats." It features a richly-ornamented entrance, the arch having an embellished entablature supported by two

* Lord Willoughby de Eresby was advanced Earl of Ancaster in August, 1892.

† See (e.g. Cooley, archt.) "An authentic History of the Professions of Painting, Sculpture, and Architecture, as have practised in Ireland," by Anthony Pasquin. 1796.

and detached Ionic columns; above is open-work parapet for clock and dial. In Andrew's Church, restored in 1878 at a cost of 6,000*l.*, are several monuments of the family, one being by Roubiliac.

WE have received, since our last issue, several other letters in regard to the subject of the representation of architecture by the Royal Academy, but as they all refer to our original circular, and are not comments on what has appeared in our columns, we need not continue the publication. There are two among them to which we may, however, refer. Mr. G. C. Horsley expresses the opinion that a bad drawing will not do justice to a good piece of architecture, any more than a poor model or bad photograph; an obvious conclusion being (though the writer does not say so in so many words) that the nature or execution of the drawing is not a matter of no importance, as some of our correspondents appeared to suggest.

Horsley objects, as we do, to photographs, as they fail to express the colour of buildings, and in regard to models he suggests that they ought to be used upon their stands, so that the usual presentation of a building should be obtained, and not a bird's-eye view. The other to which we referred is a highly-characteristic one from Mr. H. Wilson, the main point in which is, that the question of giving interest to the Architectural Room at the Academy is a very simple one indeed, that all that is wanted is—a few architects. This is, at all events, a view of the subject which no other correspondent has suggested, and which is, perhaps, worth consideration.

EMILE PEYRE COLLECTION OF MEDIEVAL FRENCH WOOD AND IRONWORK.

LONDON has been there a more interesting exhibition of genuine old French Medieval Wood and Ironwork than that opened this week at the Kensington Museum. The collection was brought together by M. Emile Peyre, of Paris, and recently been acquired as a whole by the British Museum.

Architects, and all who are interested in the craftsmanship of the past ages, when it was associated with art, will be well repaid by a visit to the museum, where they will find many exhibits of high artistic value, and entirely new in many instances, from the marks of the hands of the destroyer or restorer. The collection consists of domestic and ecclesiastical furniture and fittings of oak and iron, with their decorations in gesso and gold and in tempera. Most of the collection was gathered at a time when the destruction of these objects was an easier matter than at present. Many of the objects bear the marks of disfigurement, dealt out by angry antiquarians anxious to remove traces of royalty, and the removal of fleur-de-lis is a common form of this disfigurement took. The date of the collection covers mostly the Late Gothic and Early Renaissance periods.

The first bay of the exhibition contains, in the most part, wood exhibits of the Gothic period. On the right hand side is a portion of an oak retable with Gothic tracery, floral ornament, and shields of arms; the fleur-de-lis have escaped destruction. Beneath this is a coffer front, of fifteenth-century northern work, much decayed, but showing beautiful design. On the right is a much-eroded small oak fragment of an old stall with a preaching from a pulpit with a Gothic canopy. The adjoining oak group of the Virgin and Child of the fourteenth century is painted in tempera; it shows the peculiar conventional curve of the figure, which by some is attributed to the work of the ivory carvers upon their ivory workers in wood, the natural curve of the necessitating the curve in ivory figure-carving of size. Two small figures on either side of the example are of kneeling pilgrims in wood and gilt oak. The inscription on the gilded script, the shell badge, and the intent inscription on the faces, are all points of interest. Early sixteenth-century canopy over an altar against the pillar of a French church has a preserved fret inscription, and a tempera painting on the panel, which seems to be un-

touched by the restorer, a fate which has not been shared by a corresponding exhibit adjacent. A late fifteenth-century oak statuette of a friar is marked by much character in pose and in arrangement of drapery. It stands on a portion of an oak pulpit, the curved points of which show the woeful disfigurement of the fleur-de-lis referred to. An adjoining oak coffer of the thirteenth century is an early specimen distinguished by scroll ironwork of much interesting character. The oak panelling above the last example appears to have been entirely restored, and hardly merits a place in such good company. The statue of St. Michael, in elm, is interesting in its unrestored state, and shows very clearly the linen envelope to take the gesso and painted decoration. The bend in this figure is very marked. Another northern timber fifteenth-century coffer deserves attention, with its richly-carved front panels and shields, which have been purposely damaged. The iron shield-shaped lock is in a damaged condition, but is interesting, with its canopied hasp and pierced work, with remnants of the original red cloth behind it. Some very good examples of oak coffers and cabinets are placed at the end of the room. On the left-hand a coffer with well-proportioned panels carved with conventional vine, hop, oak, and thistle ornament, appears to have been either varnished or pickled, and has not gained in appearance; the iron lock, with its hasp in the form of a Gothic buttress, and its pierced border is well worth study. The centre coffer is a fine example of fifteenth-century work, the pierced panel hinges, with their red cloth, and the bolt-plate, occupying the best part of the door-panel; the red cloth is mostly modern, but traces of the original cloth, now without colour, are still to be seen behind the bolt-plates. The right-hand northern French fifteenth-century oak cabinet is also a fine example, distinguished by the remains of a figure of St. Michael beneath a canopy in a centre panel. The carving of the panels, and the pierced iron hinges, are exceedingly fine, and the untouched conception of the example renders it particularly interesting. The carved oak panels on the end wall all deserve attention, but the centre carved oak crucifix, from a rood-screen, with emblems of the four evangelists in the corners, especially so. The very fine oak tracing in the panels of the crucifix is not only beautiful, but a most delicately fragile piece of work.

The centre bay of the exhibition contains examples of the Early French Renaissance, and many exhibit traces of Gothic Renaissance feeling in juxtaposition. A statuette in oak of St. Ursula of Cologne is interesting, with minute figures of her virgins in the folds of her dress; the painted decoration of this figure, if it ever existed, has been most completely removed. An interesting specimen of Lyon's work is shown in a walnut-wood cabinet, carved with scroll ornament, fretwork and masks dating from the middle of the sixteenth century. Another oak cabinet, adjoining the last, is distinguished by incised arabesque ornament filled with black composition. A valuable specimen is part of a rood loft in a French church, date about 1500, with its two staircases. Some

arcading between these, carved with arabesques, shows an interesting construction of Gothic and Renaissance detail. A statuette, late French thirteenth-century work in oak, of St. Catherine of Alexandria trampling on the Emperor Maximin, well repays attention; the expressive pose of the emperor, and the cool contempt shown on the face of the lady, are amusing; the bag containing her book of devotions, with its knob for retaining it in place in the girdle, is all evidence of the dress of the period. The oak door at the end, with its tympanum graphically depicting the labours of Hercules, has a most delicate frieze, with small figures and floriated scroll. For graphic sculpture in wood the oak door adjacent is a good example. The subject suggests a buttery door, as a lifesize figure of a man is represented in the act of cudgelling a youth who is surrounded with scattered platters. There are four oak panels, which have been parts of corbels. The excellence of the carving of the subjects is most marked; they are attributed to the second half of the sixteenth century, and deserve attention. They comprise two battle-subjects, Venus in her car drawn by dolphins, and the same goddess drawn by sea-horses. Much of the old colour remains in the undercut portions. The grace and vigour of the figures in all of the panels is excellent, and is as well worth study as any of the exhibits.

In the third bay of the exhibition are to be found two portions of a delicate oak screen of the sixteenth century; the baluster-shaped columns are carved with masks and floral ornament of good character. The statuette, late fifteenth-century, in walnut, of a man, is another interesting example, showing the linen envelope for the gesso painting and gilding. There are also four cupboard-doors in the corner of room, the centre panel occupied by a small figure carved in oak and finished in coloured gesso, and much grace and refinement is displayed.

The cases in the centre of the room contain many smaller objects of great beauty. There are some fine caskets covered with leather, cut, embossed, and painted, and with beautiful clasps. The carved oak group of St. Ursula and her maidens in a boat is an interesting example of a standard head.

The examples of ironwork are no less interesting than the woodwork. They comprise boxes with wrought-iron open-work, keys, bolts, latches, knockers, hinges with open-work and red cloth, candelabra, a tripod stand with repoussé border. There is not a commonplace example amongst them, and they are all rich in design and beauty. An exhibition such as this is an admirable incentive to the arts and crafts of the day in its exposition of Medieval craftsmanship. All architects should visit this exhibition without delay. They will be well repaid.

SKETCHES AT AND NEAR CHARTRES.

OF the Cathedral of Chartres it is scarcely necessary to say anything here, so well known is it to architects, unless we were entering on a fresh and exhaustive consideration of its history or architectural character. But a sketch, to a larger scale than has usually been published, of the famous "wheel-spoke" flying buttresses, as they may be





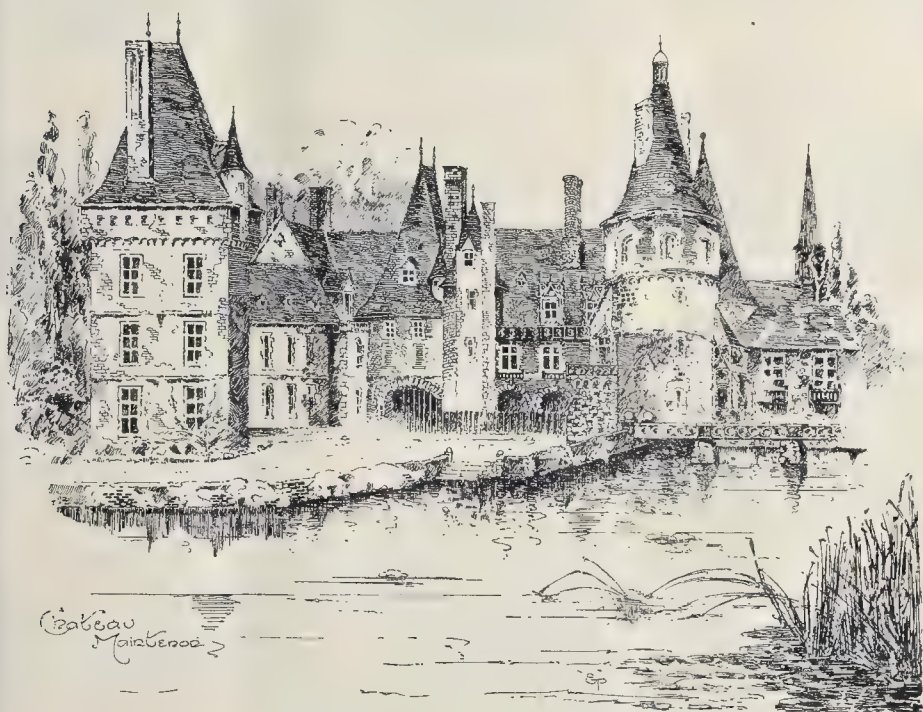
called (one of the most characteristic features of the building), and their effect as seen to a spectator looking along the aisle roof, may be of some interest to our readers.

The sketch, as well as the others given in con-

nexion with it, is by Mr. E. T. Powell, of Westminster, who adds the following notes in regard to Chartres itself and the other objects of which he sends us sketches:—

"The grey town remains quite unspoilt, and is

full of interest; in the Place-des-Epars, there in the centre a statue of General Marceau, native of this town, of whom it is written that 'Soldat à 16 ans., général à 23, il mourut à 27.' A short distance from the Place are the vario-



Sketches at and near Chartres. By Mr. E. T. Pawell.

markets for which Chartres is so noted: flowers, fruit, and vegetables, which with their vendors, camped under enormous blue umbrellas, lend a charming colouring to the old streets, the houses of which run to high-pitched gables and all manner of quaintnesses. The Porte Guillaume is the only one left of seven ancient gates of the town; not far from it is an external staircase, enclosed in a sort of turret, called "L'Escalier de la Reine Berthe," a fragment of Renaissance building of old grey wood, very interesting, and crowned with a red-tiled, conical-shaped roof. In the lower town stands the church of St. Pierre, dating from the eleventh century; the interior, owing to the beauty of its triforium and clearstory windows filled with gorgeous fourteenth-century glass, is most attractive. Behind the high altar are twelve Limoges enamels, representing the Apostles. These were executed during the fifteenth century by Léonard Limousin, and originally belonged to Diane de Portiers. At the foot of the hill round the town runs the River Eure, which, with its washings, gives an interesting colour to the scene, which is beautiful naturally. The villages round about Chartres are interesting. At Luisant, situated some four miles away, is a quaint churchyard, filled with yews, cut and shaped, giving it the appearance of an old English garden (see page 45). The yews I found to be hollowed out, forming a shelter for the grave. Eleven miles from Chartres lies the château of Madame de Maintenon, who, twenty-four years after the death of her first husband, became the wife of Louis XIV. The château is chiefly of brick, of which the four towers, including the "Pavillon," are of the thirteenth century, but the chapel and "Grande Galerie" were built by Louis XIV. From the house, looking down the grand avenue, a view is obtained of the famous aqueduct constructed by Louis XIV. at enormous expense to convey the water of the Eure to Versailles."

MOYSE HALL, BURY ST. EDMUND'S.

The illustration gives a view of part of the interior of this Early Mediaeval building, which, as mentioned in our last, it is proposed to use as a fire-engine station; a proposal which is being opposed by those who are interested in the remains of ancient architecture at Bury St. Edmund's.

Illustrations.

ST. GEORGE'S, WORCESTER.

THE view shows the west end of this church, of which we published an interior perspective, with a small plan, and a description, in our issue for September 8, 1894. The drawing shows the bold effect of the deeply-recessed arch, the space within which is occupied on the ground floor by part of the narthex, but is left as an open arch above the roof of the narthex.

Mr. Aston Webb is the architect.

NEW BANK, HALIFAX.

THE new banking premises about to be commenced for the Halifax and Huddersfield Union Banking Company is the outcome of an open competition in which prizes of 100*l.* and 50*l.* respectively were offered. Forty-three sets of designs were sent in, and Messrs. Horsfall & Williams, of Halifax, were awarded the first prize of 100*l.*, and have been entrusted with the carrying-out of the work, Mr. Mitchell Withers, of Sheffield, winning the second premium of 50*l.*

The architects' detailed estimate for the building was 12,000*l.*, and the contracts have been let for 20*l.* within this figure.

The whole of the three principal elevations will be of cleansed ashlar from quarries in the neighbourhood, the four circular columns supporting the front entrance pediment being of polished red granite.

The entrance-vestibules will be finished in Doulton ware, and the pavements of all vestibules, corridors, and the public portion of the large banking hall will be of mosaic, the remaining floors being of oak blocking.

It is intended that the building be used solely for a bank, and therefore it will be of two stories only, the ground-floor being set apart for the large central banking hall, which is surrounded by manager's room (having three waiting-rooms

adjoining) and sub-manager's room overlooking the administrative portion, directors' room and offices, accountant's office and book-safe, bullion and plate-safe, calling-over room, clerks' and keeper's entrance and offices, and an additional lavatory provided for the public.

The first floor plan surrounding or flanking the banking-hall on three sides is set apart for book-stores, manager's private rooms, and the bank-keeper's residence.

The large hall will be lighted by a large dome-light of coloured glass, and the walls will be plastered, panelled, and decorated with fibrous plaster, and the fitting will be wainscot oak.

The foregoing particulars are furnished to us by the architects. A drawing of the design is hung in the Royal Academy Architectural Room.

By the help of the illustration, our readers will now be able to form their own judgment in regard to the result of this important competition, which has given rise to a good deal of comment, and about which it was for some time difficult to obtain any information.

HOME FOR THE DYING.

THIS is the perspective view and plan, designed by Messrs. Young & Hall, which is now in the Architectural Room at the Royal Academy, and which represents, we understand, a building which it is proposed to erect, but for which no site has been as yet selected. It is intended, however, that it shall be erected, if possible, somewhere in the neighbourhood of Clapham, and the buildings will be so placed that the chapel will stand east and west. This will give a westerly aspect for the patients' rooms.

The accommodation is to comprise wards for twenty-four patients, with a residence for sisters and nurses. The class of patients to be admitted will be entirely limited to hopeless cases. The building is to be in no sense a hospital for the cure of disease.



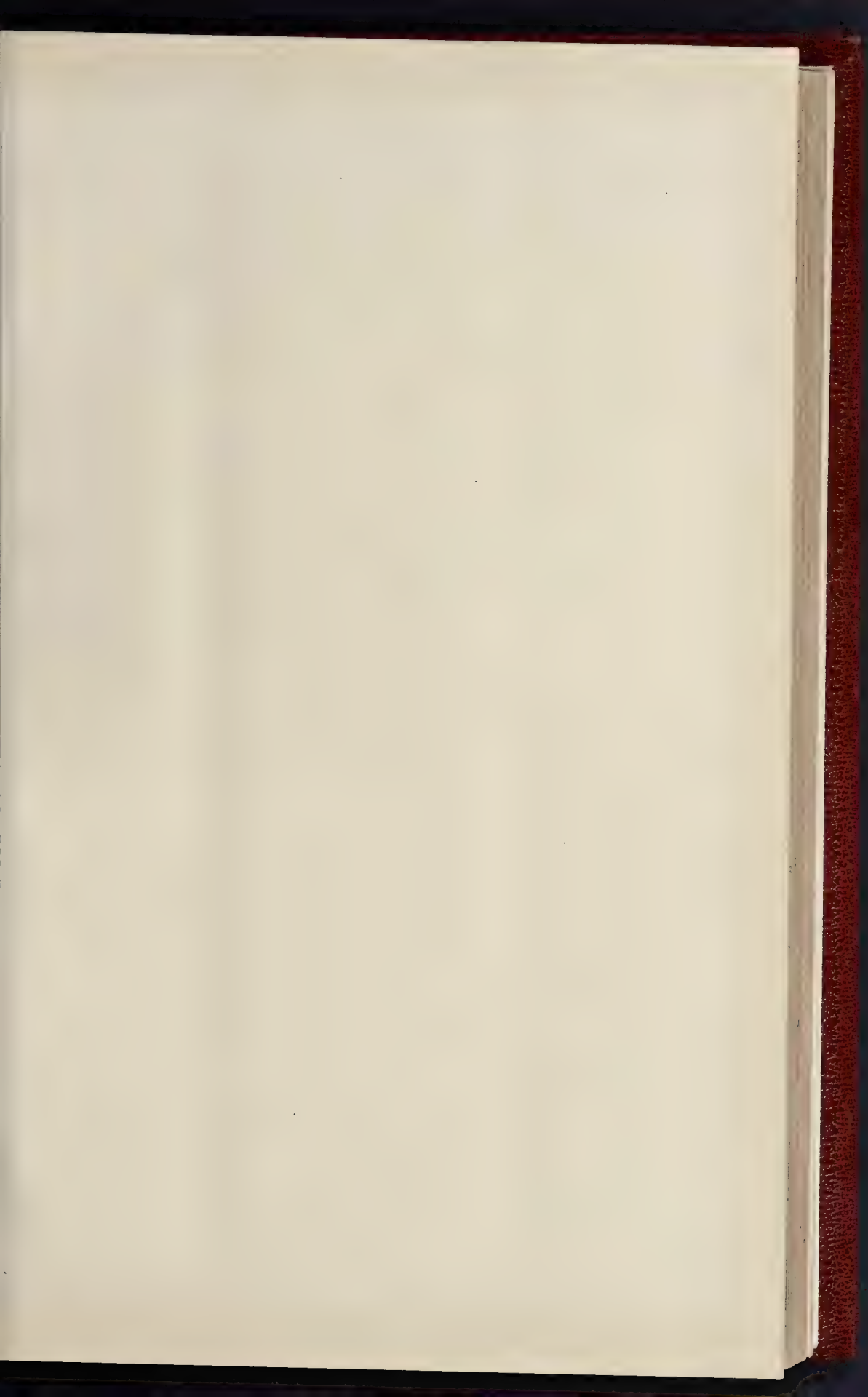
Interior of Moyse Hall, Bury St. Edmund's.

SCULPTURE SUBJECTS: "DESTINY" AND "FAITH."

THESE two illustrations represent two of the works in sculpture in this year's Royal Academy Exhibition, to which reference is made in an article on another page.

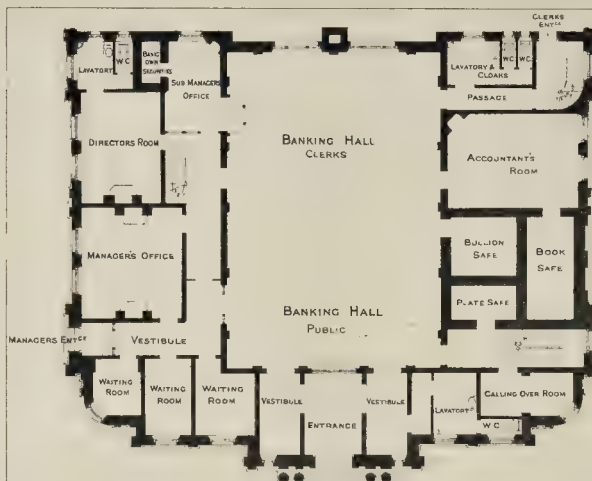
The figure entitled "Destiny," which is by Mr. A. C. Lucchesi, is apparently intended to symbolise the sadness of a soul driven into uncongenial path in life; the figure sadly but herself round with a chain of thorns. The relief under the title "Faith," by Mr. Drury, as will be seen, is a representation of the story of Abraham and Isaac.

KENT ARCHAEOLOGICAL SOCIETY.—The annual meeting of this Society will be held this year at Cranbrook. The dates fixed for the meeting are July 30 and 31. Earl Stanhope, the Lord-Lieutenant of the County, will preside over the preliminary meeting, which will be held in the Vestry Hall of the Parish Church, which will afterwards be visited. The first carriage excursion will be to Glassenbury House. From thence the party will proceed, under the guidance of Mr. W. P. Haskett Smith, M.A., to Goudhurst, and visit its church. Returning to Cranbrook, the company will dine at the George Hotel. The Lord-Lieutenant will preside at the subsequent meeting in the Vestry Hall. Here a paper will be read by Mr. J. Le André, on "Fire-backs made in the Weald illustrated by diagrams." Mr. S. Wayland Kershaw, M.A., F.S.A., the Librarian of Lambeth Palace, will follow with a paper on "The West and its Refugee Annals." Limelight views will be shown of the Roman villa at Darenth, and a descriptive matter will be given by the Hon. Secretary, Mr. George Payne. On the second day, Wednesday, the 31st, visits will be made to the churches of Benenden and Hawkhurst, and in both cases descriptions will be furnished by Mr. J. Older Scott, F.S.A. Bodiam Castle will be visited in the afternoon. Lord Ashcombe has arranged for the Castle to be opened to the Society, and Mr. W. St. John Hope, M.A., has undertaken to describe





DESTINY —MR. A. C. LICCHESSE, SCULPTOR.



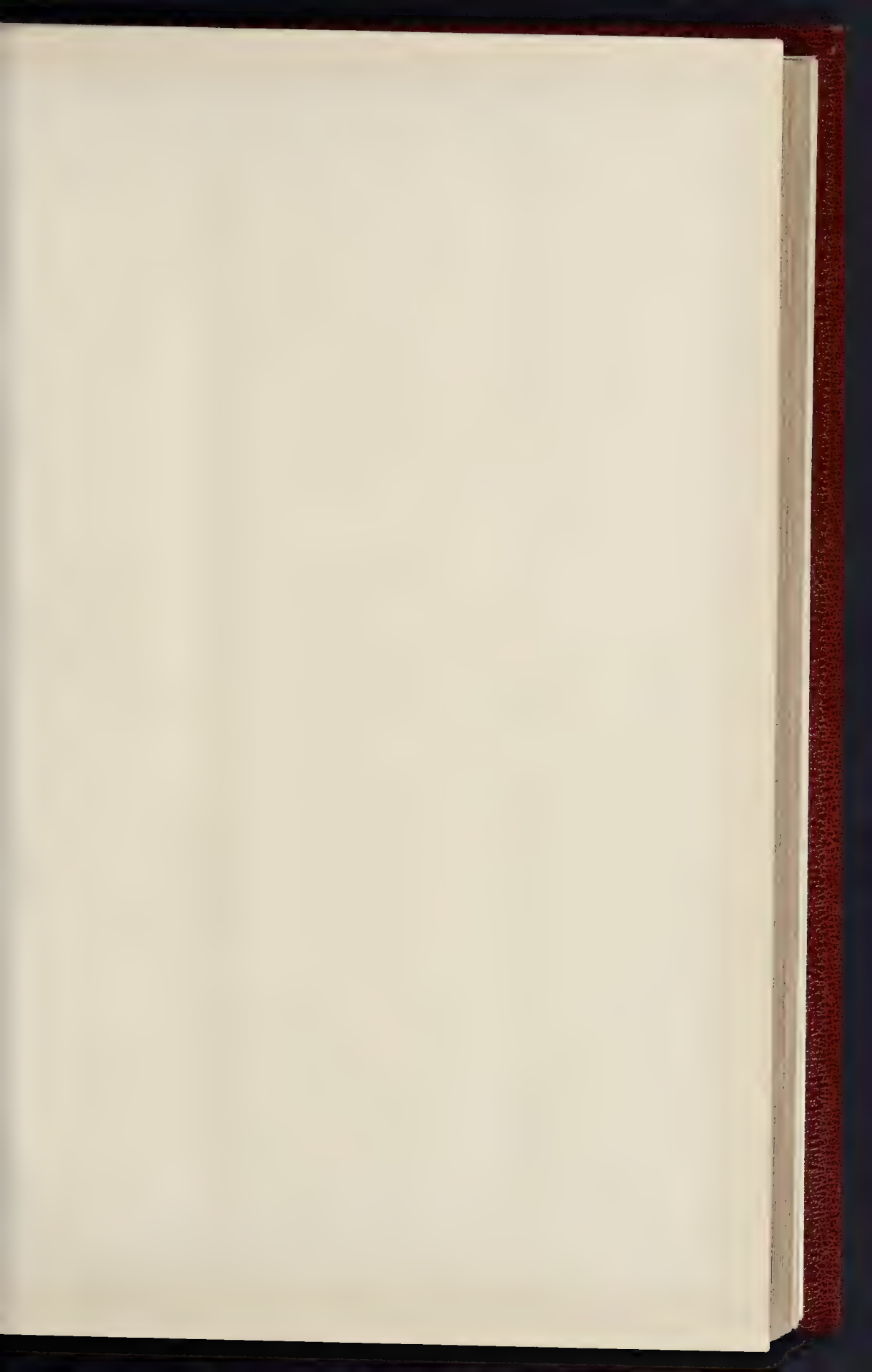
GROUND FLOOR PLAN

SCALE
0 5 10 20 30 40 50 FEET





PHOTO LITHO SEARLES & CO. 48 EAST HARDING STREET, PETTER, ANS. E.C.



THE BUILDER, JULY 20, 1895.

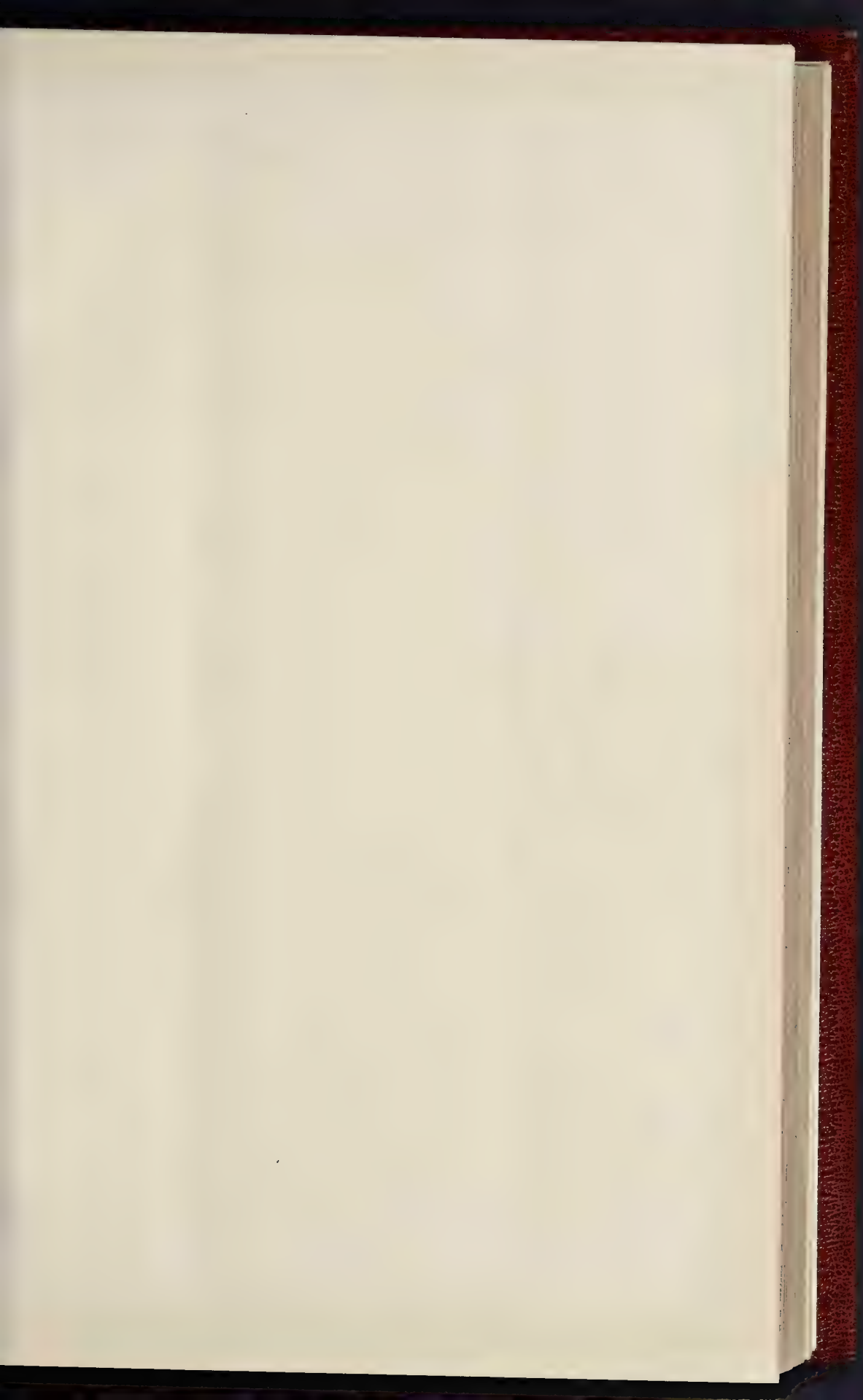


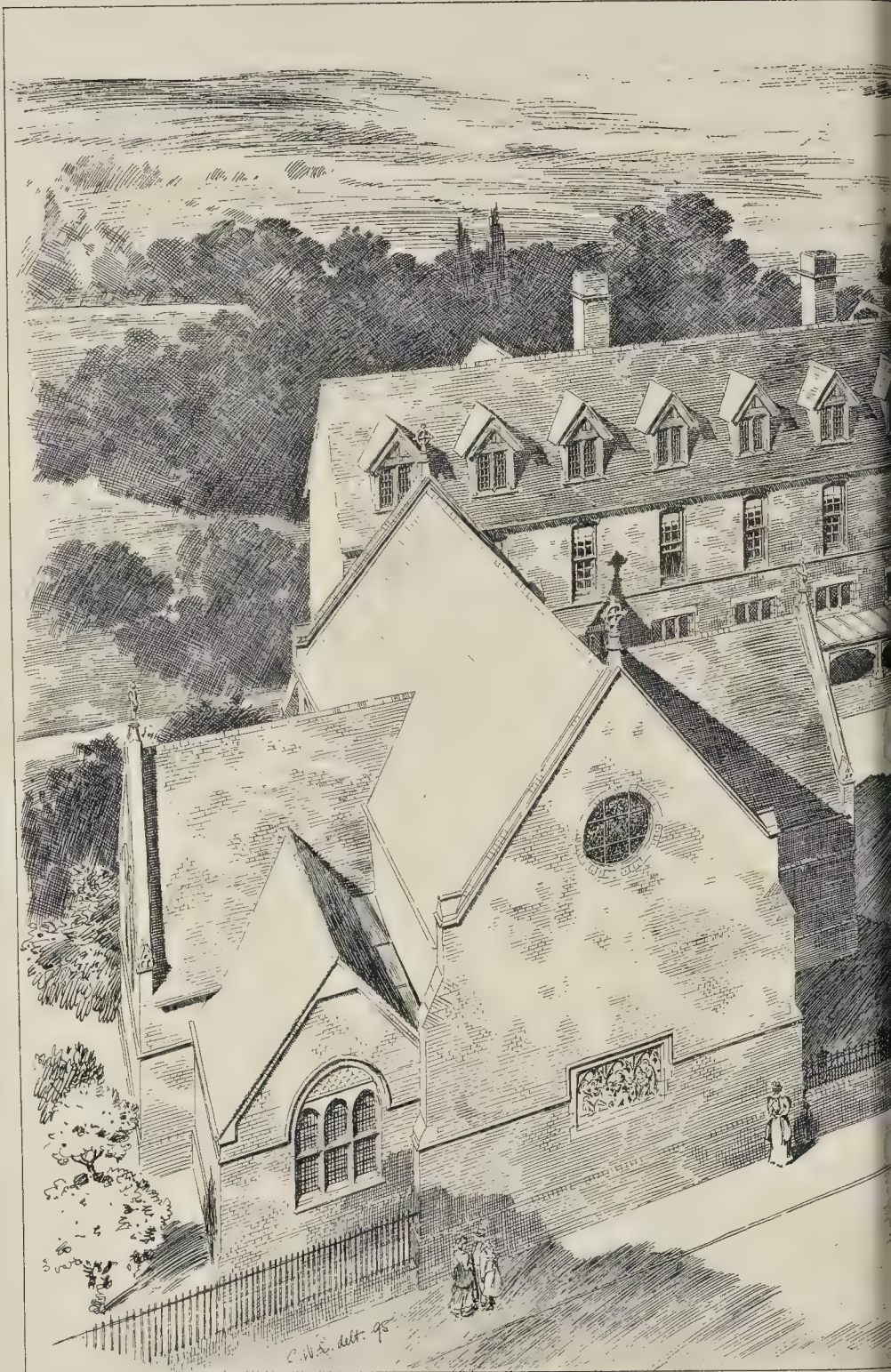


St. George's Church Worcester
 Cassion Webb Architect

PHOTO 1 TWO SIDA 31 8 "ALL EAST HADING STREET" SETTED ANT 17

W. Webb







INK PHOTO SPEC. AT A. J. & S. EAST-HARDEN. SCULPT. JETTER, GENEV.

"FAITH" RELIEF MR A DRURY, SCULPTOR

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Cost of Works carried out by the Council.—The General Purposes Committee recommended, and it was agreed, that the following words be added to clause 3 of the standing order made by the Council on February 26, 1895:—"Fourteen days before such statements are laid before the Council the account for each work shall be sent by the Works Committee to the committee on whose behalf the work shall have been carried out, and any report which such committee may desire to make shall be brought up to the Council at the same time as the statement submitted by the Works Committee."

Further Works at Claybury Asylum.—On the recommendation of the Asylums Committee it was agreed—"That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, an expenditure of £9,500. be authorised for the following works:—papering and painting wards and dormitories; purchase of pictures, ornaments, and additional fittings for needle-room and laundry; purchase and planting of shrubs and trees for airing courts; patients' shelter and additional seats for airing courts; fencing, making roads and walks, drainage of portion of land, and erection of a wash-house."

Proposed Pumping-station at Heathwall.—The report of the Main Drainage Committee contained the following paragraph, the recommendation being agreed to:—

"The Council, on January 30, 1894, approved of the proposal to erect a new pumping-station at Heathwall, and subsequently decided to acquire a portion of the premises, No. 60, Nine Elms-lane, for the purpose. We have now had before us the drawings, specification, and quantities of the work required. Exclusive of the gas-engines, for the supply of which the Council has accepted the tender of Messrs. Crossley Bros., amounting to 2,724*l.*, and the pumps, the Engineer estimates the cost of erecting the new pumping-station at 10,140*l.*, and the work is such as can be carried out by the Works Department. We recommend:—

(a) That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the work of erecting the proposed new pumping-station at Heathwall be carried out without the intervention of a contractor, and that the plans, specification, and estimate be referred to the Works Committee for that purpose.

(b) That the Engineer be instructed to prepare the specification for the centrifugal pumps required, and that an advertisement be issued inviting tenders for their supply and erection."

Drainage of Houses in Grosvenor-road, Pimlico.

The recommendation by the same Committee contained in the following paragraph was also agreed to:—

"On December 4 last the Council instructed the Solicitor to serve an order upon the Vestry of St. George, Hanover-square, to construct a sewer for the diversion from the River Thames of the drainage of Nos. 102, 103, and 104, Grosvenor-road, Pimlico, and the church adjoining. The Vestry, however, refused to obey the order, and we instructed the Solicitor to take the necessary steps to have its validity tried by the competent tribunal. A rule nisi for a mandamus was obtained, and the arguments were heard on June 17 and 18. Judgment has now been delivered, and is against the Council on the ground that the Council has no power to order the construction of a particular sewer, but only has powers of guidance and control, leaving unimpaired the discretion of the Vestry as to what sewers should be constructed. Owing to the present case being complicated by the question whether it is the duty of the Council or the Vestry to construct the necessary sewers for keeping the sewers out of the Thames, we refer the matter to the Solicitor, recommending:—That no further action be taken at present."

Legal Proceedings.—On the recommendation of the Building Act Committee it was agreed:—

"That the Solicitor do take the necessary measures for upholding in the Court of Appeal the decisions of the High Court and of the magistrate by reference to the building erected in advance of the general line of buildings in Birchington-road, Burn."

Party-wall between Nos. 1 and 3 Church-street, West.—The report of the same Committee contained the following paragraph, and the recommendation was agreed to:—

"We reported on April 9, that the District Surinder had served notice of objection upon the Surinder who was about to re-erect No. 3, Church-street, Minorities a building which had been taken down to more than half its cubical extent, with

reference to the party-wall between Nos. 1 and 3, on the ground that it was not proposed to build such wall of the thickness required by the new Act; and that at the hearing of the case the magistrate had upheld a contention made on behalf of the builder that under section 208, party-walls need never be brought into conformity with the new Act unless they had been taken down, burnt, or destroyed to an extent exceeding one-half thereof, measured in superficial feet, and of the wall referred to only a third had admittedly been taken down. On our recommendation the solicitor was instructed to take the necessary measures for obtaining the decision of the High Court upon the point, which is of some importance and likely frequently to arise under the Act. The case was argued before the High Court on June 25 and 26, and judgment was given on July 4, when, however, as the two judges did not agree (the one being of opinion that section 208 applied to the building, and the other that the Council's contention was correct), the junior judge withdrew his judgment, and judgment was given for the respondent without costs as is the practice when the judges differ. We are of opinion that it is very desirable that, having regard to the serious issues involved, the point should be submitted for the decision of the Court of Appeal, the more especially having regard to the difference of opinion of the judges in the High Court; and we recommend:—

"That the solicitor do take the necessary measures for obtaining the decision of the Court of Appeal upon the question above referred to."

Tribunal of Appeal.—The same Committee reported that Mr. J. W. Penfold had, under Section 175 of the London Building Act, 1894, been appointed by the Council of the Surveyors' Institution as a member of the Tribunal of Appeal, in place of Mr. T. Chatfield Clarke, deceased.

A Reported Strike.—Mr. Bicker-Caarter asked the Chairman of the Works Committee whether there was any truth in the report of another strike among the workmen of the Council.

Mr. Ward replied that there was a partial strike going on, but the details had not yet been fully considered. He understood, however, that the trouble was mainly owing to a statement that two of the men who formed part of a recent deputation had been discharged.

Proposed Subway under the Thames.—The Bridges Committee reported that they had been considering the question of forming a subway under the Thames to connect Rotherhithe with Shadwell, and that they found the cost of the work would depend very much upon the nature of the strata to be passed through. There was reason to believe that nothing more formidable than a bed of clay would have to be penetrated, but the Thames Conservancy Board had agreed, at an estimated cost of 400*l.*, to obtain (by means of its dredger, steam-tug, and other appliances) exact information on the subject.

It was decided, on the recommendation of the Committee, to accept the offer of the Conservancy Board.

Electric Light Transformer Chambers.—The Highways Committee were authorised to take all necessary measures for making known at the proposed Board of Trade inquiry the Council's objections to electric lighting transformer chambers being placed under the public streets.

The meeting, which was thinly attended owing to the General Election, lasted only three-quarters of an hour.

Books.

Ancient Rome and its Neighbourhood; an illustrated Handbook to the Ruins in the City and Campagna. By ROBERT BURN, M.A. London: George Bell & Sons, 1895.

THE real handbook now, for those who take their Rome seriously, is Professor Middleton's; but it must be admitted that it is more a book for study at home before going the rounds than for carrying about with one. Mr. Burn's book is small enough to be carried about, and at the same time has a scholarly character which places it above the level of the ordinary guide-book. The remarks on the Colosseum (he adopts the spelling "Coliseum," which we think less correct, both historically and grammatically) show that the author has paid attention to the various views which have been advanced in regard to its construction, flooring, &c., and he gives his readers an outline or sug-

gestion of these so far as the limits of his work allow. It is curious that while he is evidently acquainted with the French drawings and restoration, and refers to them, he, like every other writer on the subject (as far as we have observed) entirely passes over the ingenious suggestion of the French engineers as to the inclined planes from the dens to the arena, which receives at all events important support from the presence, in various parts of the sub-structure, of obliquely-placed ranges of putlog-holes. On our first study of the French drawings, many years ago, we were struck with the apparently logical character of this suggestion, so different from the late Mr. Parker's ridiculous windlasses and trap-doors, for "winding up" the animals to the arena level, and we do not think it has ever received the attention it deserves.

Mr. Burn's book is illustrated by plans, which are useful and valuable, and by some very poor engravings which are of no value. The process of reproduction from photographs is now so easy and cheap, and they are so infinitely more trustworthy than engravings from sketches, when the object is to give the precise facts as to a piece of antique work, that we are surprised it was not adopted in this case.

Encyclopédie de l'Architecture et de la Construction. Tables du Texte et des Dessins. Paris: Aulanier et Cie.

THIS is the index to the "Encyclopédie de l'Architecture," the successive volumes of which have been from time to time reviewed in our columns, but it is something more than an ordinary index, the subjects being classified under various heads, forming in fact several indexes. There is a table of words treated classified alphabetically under various heads, such as "Art," "Assainissement," "Biographies," "Chauffage," &c. Biographical notices are next indexed separately under the names of the persons treated; of another index states the articles under which the explanation of various technical terms and subjects will be found, another groups and indexes the countries and localities referred to in the Encyclopédie. The index, which is of course uniform with the rest of the work, is exceedingly well done, and will greatly increase the value of the book for reference.

Acoustics in relation to Architecture and Building. By T. ROGER SMITH, Architect. New edition, revised. With twenty illustrations on wood. London: Crosby Lockwood & Son.

THIS is a re-issue of Professor Roger Smith's small but comprehensive work on this subject, one of the set known as "Weales' Series." Although this is professedly and by its very title a "rudimentary series," we are not aware that any better guide in regard to the acoustics of public buildings has appeared since this book was issued. The subject of the behaviour of sound in large buildings is in fact still so imperfectly understood, and we are so much in want of further statistics and a greater body of accurate experimental observations, that perhaps the time has hardly yet arrived for treating this subject more fully in a complete treatise and on a scientific basis. In the meantime Professor Roger Smith's small treatise probably contains nearly all that can at present be certainly affirmed and acted upon in regard to the acoustic treatment of buildings of various classes.

The present edition has not been much modified, owing, we are told, to want of time to devote to it on the part of the author. A couple of pages have been added as to new modes of detecting and analysing sound-vibrations, and a few words are devoted to the microphone, phonograph, and telephone. Two or three pages have also been added in regard to the methods of remedying acoustic defects in existing buildings. The recommendations made in regard to investigating the cause of the defect, and curing it when discovered, are practical, and such as are easily understood and carried out. Whether they would always result in the desired improvement is another question; but the probability is that they would cause more or less improvement, and that there is not more certainty in the matter is a fault which can hardly be charged against the author in particular, since certainty at present is not to be had.

A list of books of reference in regard to the science of acoustics, and another of books on acoustics as applied to buildings, are given at the end of the book.

* Reported in the *Builder* last week, p. 36.

Notes on Shipho: A Sequel to "Japanese Enamels." By JAMES L. BOWES. London: Kegan Paul, Trench, Trübner, & Co. 1895.

"SHIPHO" is the Japanese name for cloisonné enamel, so named as containing the "seven" precious things—gold, silver, emerald, coral, agate, crystal, and pearl. The present work is a kind of appendix to the author's former and larger treatise, and is intended to supplement the latter by the later information on the subject gained during the last ten years, and to answer some criticisms in regard to views expressed by the author in his former treatise.

Illustrations of several celebrated pieces of work are given, with critical remarks on them. A chapter is given on Japanese glassmaking, one on signatures and other marks, and one on the Hirata family and their works, of which a good many photographic illustrations are given. Into the merits of the points of controversy between Mr. Bowes and his critics we cannot enter; they are hardly of interest except to Japanese collectors; but the book is a useful and interesting addition to his former publication, and should be obtained by those who possess the previous work, as rendering the author's treatment of the subject more complete.

The London Building Act; with copious index notes, cross references, &c. Edited by BERNARD DICKSEE. London: Edward Stanford. 1894.

THIS is a shorter and more concise edition of the London Building Act than that of Professor Banister Fletcher. It gives after each section notes as to the difference between the new and the old legislation, where there is any parallel between them, or states when the enactment is entirely new, and where necessary summarises or explains its real force and meaning. Former enactments of the same class which are repealed are given in full in the annotations, so that they can be compared with the new provisions. There is a full and well-arranged index, and the by-laws and regulations of the London County Council are reprinted in the book, which makes a very handy and convenient comment on the new Act. Some diagrams are added, showing in graphic form the effect of some of the provisions of the Act.

Association of Surveyors of the Royal Engineer Establishment: Occasional Papers. A. H. SWISS. Devonport. 1894.

ALL the papers collected in this small volume are of practical value, being based on experience and observation. The most important is that on "Barrack Construction," by Mr. T. Marrable. We learn from it with some surprise that the "scullery" has been long omitted from barrack plans, as unnecessary. The author of the paper is strongly in opposition to this view, and we need hardly say that we entirely agree with him. As he truly points out, by the system of washing out in the living-room and placing the utensils on a centre shelf (even this is regarded as a kind of luxury), all the germs of disease, along with dust and dirt, floating about in the barrack-room, have the opportunity to settle on the plates and other vessels used in cooking and serving meals. Other useful papers are on "The Computation of Earthwork," by Mr. Bertram A. Raves; on "Iron Buildings," by Mr. A. J. Emery; on "Maltese Methods of Building," by Mr. Gavin J. Burns; and on "Ventilation," by Mr. C. J. Morris, a short paper into which a great deal is compressed. The author does not seem very clear in his own mind as to the position of inlets and outlets, as in one paragraph he recommends inlets near the ceiling and outlets near the floor on the opposite side, as the theoretically perfect system (in which we do not agree with him), and on the next page recommends in practice inlets and outlets at about a height of 6 ft. from the floor, in regard to which we can only agree with him as to the inlets.

The Journal of the Sanitary Institute (Quarterly). Volume XVI., Part II. London: E. Stanford. 1895.

THE July number of the *Journal* contains several valuable papers, among which that by Dr. Poore on "Dry Methods of Sanitation" is the fullest and most important; indeed, if we could accept its teaching, its importance is enormous; but we can hardly do so. It is, however, a paper which we recommend to the notice of all sanitarians: Dr. Poore is thoroughly in earnest, and has marshalled the facts in favour of his views with the greatest ability; nor are we inclined to dispute his facts in themselves. What we maintain

is, that he ignores or passes over other facts which would be somewhat at variance with his position. Among other important and useful papers in the volume are one on (or rather against) "Combined Drainage," by Dr. Sykes; and one on "Back-to-back houses," by Dr. Niven, with illustrations prepared by Mr. de Courcy Meade. It is almost needless to say that the object of the paper is to show the evil results of this arrangement of dwelling-houses.

Bungalows and Country Residences. By R. A. BRIGGS, F.R.I.B.A. Third edition, with additional plates. London: B. T. Batsford. 1895.

WE need only mention the appearance of a third edition of this work, which has had a remarkable success, appealing as it does to the interest of the majority of house-builders, those, namely, who want small houses. Four new plates have been added.

TRADE CATALOGUES.

MESSRS. JOHN BOLDING & SONS send us a large illustrated catalogue of their sanitary fittings, &c. Among special items may be mentioned their syphonic action latrine, the portable water-closet with a reservoir of water within the framing and a removable pail under the basin; various forms of waste-preventing service-cisterns, including the "Tranquil" syphon, which professes to be quite noiseless. Some of these are made with a lead lining to a porcelain or mahogany case, so as to present a neat appearance without necessitating any casing. The catalogue includes also many descriptions of lavatories, urinals, and sinks, baths and fittings, plumbers' brasswork, pumps, &c.—Messrs. T. Crapper & Co. send us a large illustrated catalogue of sanitary appliances, including baths, sinks, valve and washdown closets, lavatories, urinals, water-waste preventers, traps, rain-water and soil-pipes, &c., showing a great variety of work, and including several special features.—The Standard Iron Company send us an illustrated catalogue partly consisting also of sanitary apparatus, but containing also grates, ornamental crestings, boilers (including their improved portable boiler), garden-chairs, gates, and railings, stable-fittings, and in fact nearly all things which are or may be made of iron.

The Student's Column.

METALS USED IN BUILDING.—III.

THE PRINCIPAL ORES (continued).

IT will be convenient, for many reasons, to consider copper and tin together so far as regards their mode of occurrence in this country, though they have but little in common in other respects. But in the first place we will state the nature of the ores of each metal. *Copper*.—This is found in a native condition in many parts of the world; but only occurs in sufficient quantities to be exploited as an ore direct in few localities, notably in the neighbourhood of Lake Superior. The native metal is usually associated with other copper ores, and often with silver. The whole of them are very commonly found in connexion with minerals containing magnesia. The most abundant ore of copper raised in England is the *pyrites* (copper, iron, and sulphur) containing about 35 per cent. of copper when the pyrites is pure. Its colour is yellow with a brassy lustre, and the mineral is often confounded with iron pyrites; when in the crystalline form, however, it affects the tetragonal system, whilst the iron pyrites is cubic, and there are other points of difference, principally in regard to lustre and hardness. *Peacock copper* (copper, iron, and sulphur) is so-called from the bright blue, red, and yellow variegated tints assumed by the mineral; the ore differs also from pyrites in having a higher percentage (56) of copper. Closely allied to these is the equally common *grey copper ore*, exceedingly variable in composition, but always containing copper, sulphur, antimony, arsenic, and iron, and frequently also silver and zinc. In some instances the proportion of silver present is sufficient to lead to its extraction. All three of these ores having large quantities of sulphur and iron, are found abundantly in Cornwall, whilst the copper pyrites is plentiful in Devon, Sweden, Saxony, Australia, and Siberia. The neighbourhood of Freiberg furnishes large supplies of the grey ore.

Turning now to ores of sulphur and copper, the best known as occurring in Cornwall is *copper-*

glance, with about 80 per cent. of the pure copper. In addition to its crystalline form, it occurs massive with a compact granular structure; its colour is steel-grey. It is one of the most important copper ores in the county, and is especially valuable as being generally free from foreign matter. It is found abundantly in certain parts of Siberia. *Indigo copper* is similar in composition to the last-mentioned ore, but has only about 67 per cent. of the pure metal. It is dark blue in colour, and comes from Chili.

Two principal oxides of copper are raised, the red and the black. *Red oxide of copper*, or cuprite, has 89 per cent. of pure metal when the ore is very good. It occurs in different shades of red, especially "cochineal" red, and has a sub-metallic to earthy lustre. It is found in nearly all the copper-producing districts, and is fairly abundant in Cornwall. The *black oxide*, or tenorite, has about 80 per cent. of copper, and occurs chiefly as a black powder, also in massive earthy lumps, and in shining and flexible scales. It is abundant in certain mines of the Mississippi Valley, in parts of Tennessee, and in Chili.

Carbonates of copper form two chief ores, viz., *malachite*, or green carbonate, and *azurite*, or blue carbonate; the former contains about 58 per cent. of copper and the latter 55. Both of them are very valuable, not only for their purity and the general excellence of the metal yielded, but for ornamental purposes. They are found plentifully in certain parts of Australia; whilst malachite comes from Siberia, the Urals, and other parts of the world.

The figures, as to quantity of copper found in the different ores, assumes, naturally, that the latter are quite pure—which is seldom the case in large quantities. The amount obtained by smelting British ores is about 4 per cent. more than that calculated from the dry assay. Thus in the case of an ore containing 5 per cent. of copper by dry assay, the actual yield is taken as 5½ per cent. Another source of copper not mentioned in the foregoing account, as it is not strictly speaking an ore, is known as *copper precipitate*. This is obtained in small quantities in Cornwall and Devon, but principally from cupreous water pumped up from an old mine on Parys Mountain in the Island of Anglesey. The relative quantity thus derived, as well as particulars concerning the value and output of the ores, will hereafter appear in our observations on the statistics of minerals raised in the United Kingdom.

Tin.—This metal does not occur in a native condition except, perhaps, in association with gold in the Ural Mountains. The ore from which practically all the tin of commerce is obtained, is familiarly known as *tin-stone*, or, as mineralogists call it, *cassiterite*. This is a binoxide crystallising in the tetragonal system, but is found principally in a granular or massive form, the particles being in some cases so minute as to be difficult to detect. It is usually black or brown, rarely yellow in colour. The only other tin ore is *stannine*, or tin-pyrites, a mineral of steel-grey colour when pure, but sometimes brownish yellow, blue, or black. It is not of much importance, occurring so sparingly in Nature. Prior to the exploitation of the rich ores of Malacca, Banca, and of parts of Australia, the greater proportion of tin came from Cornwall and Germany. At the present time the metal is also mined in Sweden, Siberia, and North and South America. Confining our attention for a moment to Cornwall, it may be said that there are two varieties of tin-stone, one known as *wood tin*, in which the structure is compact and fibrous internally, and is somewhat resembles wood in appearance; another, called *road's eye tin*, is like the last-mentioned only that the structure is of a diminutive scale.

Tin is obtained from two different sources, namely, from lodes or veins, of which much is presently, and from alluvial deposits. These latter, from which enormous quantities were formerly obtained in Cornwall, were to a large extent derived from the destruction of solid rocks in which the metal was contained. In other words, the usual agents of denudation destroyed these rocks, and with them the lodes in which the tin occurred; but whereas a large proportion of the rocks were removed in solution and the lighter particles taken out, it may be, to sea by the action of rivers and streams, the particles of tin being much heavier were not so easily dealt with, and tended to accumulate in convenient points. The ore obtained from these alluvial deposits is known as *stream-tin*, as distinguished from that obtained in lodes, which is called *mine-tin*.

Copper and Tin Lodes.—First of all, what do

mean by a lode? We cannot enter into the technicalities of the subject from the miner's point of view, or pretend to describe its nature in detail. Briefly, it may be said that mineral veins or lodes are of two kinds. The mineral matter in the kind is entirely deposited in fissures permeating more or less solid rock (see fig. 1); in

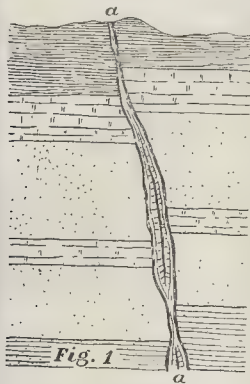


Fig. 1

G. 1.—Showing Mineral Lode confined to a Fissure.

a = Mineral vein, or lode.

the other kind it may be found not only in the fissure (which may be very insignificant in proportions), but in the rock next the fissure through which the latter runs (see fig. 2). In fact, the



Fig. 2

G. 2.—Where the Lode penetrates also into the surrounding (or "country") Rock.

Fissure; b = Adjacent rock impregnated with ore (dotted). Both a and b form the lode.

may be regarded as a band of rock guided by its general direction by the fissure, from which the minerals are obtained. That is not exactly a geological definition of the term; amongst other things it is immaterial to the scientist whether the vein, or lode, contains matter of commercial value or not. The function of the fissure in certain cases seems to be that of a channel for the conveyance of certain agents which have altered the rock, at places, through which it runs, the nature of the alteration being simple decomposition, or that accompanied by introduction of new mineral matter, which may or may not be of commercial value. In Cornwall, a tin lode may consist of a mass containing mineral matter, but most of it may be found impregnating the surrounding rock—granite. At the same time, it is remembered that, in many instances, valuable metals occur only in cracks and fissures.

Before proceeding with our description we must first of all state the student to weigh well in his mind what has just been said. We learn that in these cases the minerals occur in the most capricious manner. The mining engineer points out the direction along which the lodes crop out at the surface; he is an adept at working these lodes and is not a beginner; but there are certain things of vital importance which neither he nor anyone else can state—viz., (1) The length, breadth, and

regularity of a fracture of the kind accompanying the lodes; (2) Whether, having found paying quantities of ore near the surface, the same phenomena will obtain at greater depths; and (3) As to how far rich "country" rock will continue in the same condition. Certain valuable metals, as tin, are found in pockets, or rich lumps of impregnated rock. Who can foretell the size of such pockets, or guarantee that each will maintain an uniform richness throughout? If anyone could do so, with the slightest approximation to accuracy, depend upon it he would not scatter the precious information broadcast to satisfy the greed of the speculator. We commend this to the serious consideration of the student, and would remind him of the Cornish miners' maxim in reference to good ore, viz., that "Where it is, there it is."

Copper and tin occur in a very peculiar manner in Cornwall. The general geology of that county may be briefly summarised as follows:—The fundamental rock is granite, which pertains from Dartmoor, in Devonshire, through the neighbouring county to the Scilly Islands, and much farther in the same direction under the sea, for aught we know to the contrary. The surface of this granite is very undulatory, and in the troughs, or basin-shaped depressions of the undulations, a rock known as clay-slate is found resting directly on the granite. There are other minor details concerning which we need not trouble ourselves at present. But it should be stated that the rocks are much fissured, and these cracks contain the ores and other mineral matter. The fissures are, occasionally, of such length that they may be traced for many miles, the same crack being found to run continuously through granite and clay-slate (killas). Roughly speaking, there are two prevalent directions in which these veins run: one set runs east and west, or north-east and south-west; the other north and south. Those having a general easterly and westerly direction produce what tin and copper are raised, whilst those running across them have either no mineral of any commercial value, or contain iron, lead, &c., though the last-mentioned metal is occasionally found in the east and west veins. Another peculiar circumstance is that, in general, where one lode runs through both killas and granite, and contains copper and tin, the copper will be found in that portion which runs through the killas, whilst the tin is confined to the granite section, the two metals being associated together at the junction of the two rocks mentioned. The accompanying diagram (fig. 3), makes this point clearer. In this there are two rocks, the killas (a) resting on the granite (b); the mineral lodes run from the surface of the ground through these rocks and produce copper ore in the a section, tin ore in the b section, and tin and copper together at the junction. It would appear, therefore, that the formations in which the mineral lodes occur influence the character of the ores found in them. It should be mentioned, however, that copper ores are occasionally found outside the killas area, and the tin, as a rarity, may not be associated with granite. All the same, as a matter of experience it has been ascertained that, when a vein begins in the clay-slate, copper is the ore mined, and on penetrating to depths and passing into granite, it is changed into a tin mine. The mixture at the point of junction alluded to has proved disastrous in many cases, as the ores there cannot be very easily dressed and separated. Many mines not having been able to tide over this difficulty have come to an end. The bulk of the copper and tin ores raised in Cornwall has been obtained from deposits that affect a magnetic bearing ranging between 5 deg. north and 25 deg. south of east.

Fig. 3.

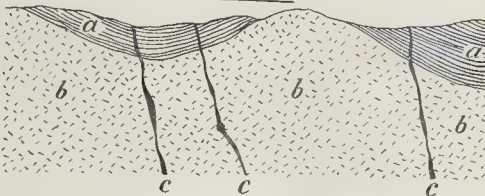


FIG. 3.—Section through Rocks containing Copper and Tin Lodes.

a = Clay slate, or "killas," resting on b = granite. c = mineral lodes.

GENERAL BUILDING NEWS.

BOARD SCHOOLS, SOWERBY BRIDGE.—The proposed new Board School at Bolton Brow (for which plans have been prepared by Messrs. C. F. L. Horsfall & Son, and accepted by the Sowerby Bridge School Board), will contain three departments, which will provide accommodation for 200 boys, 200 girls, and 200 infants.

SCHOOLS, DARLINGTON.—The Bishop of Durham laid the foundation-stone a short time since of the new day- and Sunday-schools which are situated in Greenbank-road, Darlington. The buildings have been designed by Mr. G. G. Hoskins, Darlington. The architecture is a simple type of the Queen Anne style, and scholastic in character. The materials to be used are grey clump bricks, relieved with red pressed bricks and terra-cotta. On the ground floor accommodation is provided for 150 infants, and consists of a schoolroom, 38 ft. by 22 ft.; a class-room, 22 ft. 6 in. by 18 ft. 9 in.; a marching hall, 27 ft. 3 in. by 24 ft. 6 in.; teachers' room, a room for school cleaner and utensils, lavatories, hat lockers, &c. On the first floor provision is made for 200 girls, consisting of a schoolroom, 38 ft. 8 in. by 22 ft., and two class-rooms, each measuring 24 ft. 9 in. by 24 ft. 6 in. By an arrangement with movable partitions, one on the west side of the schoolroom and the other dividing the class-rooms, two halls of different sizes can be formed, one about 50 ft. by 24 ft. 6 in., and the other about 47 ft. by an average width of 44 ft. The remaining area of this floor is devoted to two teachers' rooms, hat and cloak lockers, lavatories, &c. At the rear of the buildings is a playground, a portion of which is covered, the open side having a south aspect.

BAPTIST CHAPEL, STAFFORD.—The memorial-stones of the new Baptist Chapel in Lichfield-street, Stafford, were laid on the 10th inst. The building is to embrace a church to accommodate 430 persons, a Sunday-school, a church parlour, vestries for the deacons and minister. The architect is Mr. Harper, Birmingham, and the builder is Mr. Marshall, of Smethwick.

BATHS, DALRY, EDINBURGH.—The new baths at Dalry, Edinburgh, built by the Corporation in Caledonian-crescent, were opened on the 13th inst., by Lord Provost McDonald. The architect was Mr. Morham.

CHURCH, LISCARD, CHESHIRE.—The foundation-stone of Christ Church, which is being erected on the site of the original iron building in Martin's-lane, Liscard, was laid on the 13th inst. The building, when completed, will cost about 3,000l. The new church will accommodate 500 persons, the contractors for the works being Messrs. W. H. Bleakley & Co., Birkenhead; while Mr. T. Barry, of Liverpool, is the architect.

CHAPEL OF EASE, YELVERTON, DEVONSHIRE.—A chapel-of-ease to the parish church of Buckland Monachorum has just been erected at Yelverton. It consists of a rectangular building and vestry, lighted with lancet windows, a group of five windows being placed at the east end, and all being filled with cathedral glass. Mr. C. King, of Plymouth, was the architect, the contractor being Mr. Gilbert, of Horrabridge.

SCHOOLS, MEDICAL BENEVOLENT COLLEGE, EGHAM.—On the 8th inst. the Prince of Wales laid the foundation-stone of the buildings for the new Lower School in connexion with the Royal Medical Benevolent College at Epsom. Sir Arthur Blomfield is the architect, Mr. J. R. Harding the clerk of the works, and Mr. Dorey the builder. The new building is to be erected in red brick, with stone dressings, and will be complete in itself, with masters'-rooms, class-rooms, dormitories for 100 boys, and a small central tower.

ROYAL LINKS HOTEL, CROMER.—The Royal Links Hotel, at Cromer, was opened on the 13th inst. by Lady Hastings. The hotel is situated at an elevation of about 250 ft. above the sea-level, adjoining the Royal Golf Links and Club-house. A contract has been entered into to make an approach from the sands by means of steps up the cliff in front of the hotel. The Royal Links Hotel was built under the supervision of Mr. Homer, London, and

contains in all about seventy bedrooms, private sitting-rooms for visitors, and a suite of public reception-rooms, the latter of which are on the ground-floor, and comprise coffee, drawing, reading, smoking, and billiard-rooms.

ADDITIONS TO REIGATE PRIORY, SURREY.—During the past two years additions have been in progress at Reigate Priory and a new wing has been added to the old building, and some improvements have been made. The old entrance-gates in Bell-street have been removed, and a new door has been formed on the north side of the house, which will, in future, be the principal entrance, and will be reached by a drive opening out on Park-lane. The old entrance-gates and pillars have been placed between the north-west angle of the house and the block of offices running parallel with it. A new entrance-hall has been made by throwing into one several small rooms on the ground floor. The drawing-room, which is entered from the Holbein Hall, has been considerably enlarged. The conservatory, which formerly adjoined the room, has been taken away, and the space it occupied built over, thus making an addition of about 45 ft. There have also been several alterations to the library. The ground floor of the new wing of the building is exclusively devoted to the use of the domestics. Here are the offices—kitchens, store-rooms, strong-room, dairy, &c. At the end of the corridor, which gives access to these rooms, is a lift that communicates with each landing. A door leads from the corridor into the stable-yard and out-offices, which form part of the recent additions. The offices are built round the yard so as to form a square. On the west side are the coach-houses, with the men's living-rooms on the first floor; on the north is the entrance-gate, and store-rooms devoted to various purposes, and on the south the stables, while the new wing of the house forms the east side of the yard. There is a gymnasium in one of the rooms above the stables fitted with all the necessary apparatus. Through the Priory—the old portion of the building as well as the new wing and out-offices—the electric light has been introduced. In the old portion of the building no very drastic changes have been made. To preserve as far as possible its original character was the object of the architect, Mr. J. H. Pollen, whom Lady Henry Somerset engaged. The builders have been Messrs. Bagley & Sons, of Redhill and Meadvale, who have inserted the oak panelling to the Holbein Hall. The new wing is 207 ft. long, and besides the apartments on the ground floor, about twenty bedrooms have been built, and comprise the first and second stories. The entire cost of the building, restoration, and improvements is nearly 20,000l.

LONDON HOMOEOPATHIC HOSPITAL.—The new buildings of the London Homoeopathic Hospital, which were opened last week by the Duchess of Teck, are an important addition to the modern London hospitals. Originally established in 1849 in Golden-square, the hospital was moved in 1859 to Great Ormond-street, and the work in connexion therewith increasing so rapidly the present buildings were put in hand. On a site which is somewhat confined, the planning of the building is most ingenious, and reflects great credit on Mr. W. A. Pite, F.R.I.B.A., who has acted as architect of the new buildings, which are in every way abreast of the latest ideas in hospital construction. The general distribution consists of three main blocks to Great Ormond-street, behind which are placed tower-like structures cut off from the main buildings by air-spaces bridged by covered and cross-ventilated corridors. The central of these three main blocks contains on the ground floor the main entrance, casualty, and porter's room, to the front and behind the main staircase, of Victoria stone, and left, on the upper floors are placed the matron's apartments, the resident medical officers' and servants' bedrooms. The central rear tower, thoroughly disconnected by air-spaces, as mentioned above, contains the boiler-room in the basement, and above, the medical staff room, dining-room, operating-room, isolation-room, and servants' bedrooms. The main west wing, which, like the east wing, is connected to the central block by covered bridges, having an air-space above the ground floor, contains the offices on the first and below, contains the board-room and offices on the ground floor; an eight-bed ward—23½ ft. long, 28 ft. wide, and 13 ft. high—on each of the first, second, and third floors; and special wards on the fourth floor. In the rear the west tower contains lavatories on each floor from the basement to the roof, totally disconnected from the wards by means of the covered bridges. The east block, which is considerably longer than the west, contains fourteen-bed wards—50½ ft. long, 28 ft. wide, and 13 ft. high—on the ground, first, second, and third floors, and special wards on the fourth floor; while the east tower contains the lavatories. The whole of the basement is given up to the out-patient department, with a separate entrance and exit to the street, and great care has been taken to completely isolate this department, the only connexion being a staircase leading from a disconnection lobby. Each patient will have 100 square feet of floor space and 1,400 cubic feet of air. The wards are floored with polished oak by Messrs. Turpin. The walls have rounded angles, and are finished internally with Portland cement faced with Keene's cement, twice painted, and finally distempered,

which gives an unglazed surface agreeable to the eye; the dado is varnished for sanitary reasons. The heating to the wards is effected by means of Boyd's hygienic ventilating stoves placed in the centre of the ward; the flues to these stoves are carried under the floor, the medical officer thus having a full view of the ward without any obstruction. The ventilation is effected by means of air-ducts leading to the stoves and regulated by valves. All the window openings have Miller's patent reversible sashes, which serve the double purpose of a sash-window and a casement hung on pivots, and by means of which the wards can be flushed. Each ward has attached to it a ward-kitchen or duty-room, fitted with gas range, and a bath-room. The building will be lighted by electricity, carried out by the Electrical Installation Co. The flooring of the main corridors will be of marble terrazzo, by De Grelle, Hondret, & Co., giving a polished and impervious surface. Fireproof construction upon Dawson's system has been employed throughout, both for floors and roofs, consisting of steel joists and cement concrete of Portland cement, Thames ballast, and coke-breeze. The sanitary work, which has been very carefully planned, has been executed by Messrs. Dent & Hellyer. The water-pipes are fixed in view, and painted distinctive colours. Hellyer's "bracket" water-closet basins are adopted, and are fixed in a space between the trap and floor to facilitate cleansing, and all the lavatories have cement floors, with hose-pipe attachments for cleansing. The water system and the gas-cooking ranges are by Messrs. James Slater & Co., as also the general warming of the hospital, which is by hot water on the low-pressure system. The communication between different parts of the hospital is by the telephones of the Private Wire and Telephone Co., and is very complete, being arranged in such a way that by the insertion of a pin direct communication is effected to any part, and does not of necessity go through the porter's box, as is usual. The architectural treatment of the exterior is a simple plan of Portland stone and red, the hospital brick applied to a sash-frame treatment of openings, quite in harmony with the uses of the building. Mr. Thos. Boyce has been the general contractor. Messrs. Colledge & Bridgen, of Wolverhampton, supplied the locks, and also the silver-gilt presentation key for the opening ceremony.

MISCELLANEOUS.

HOUSES IN GREEN-STREET, CHARING CROSS.—The last two houses on the north side of Green-street, Charing Cross, which have stood in advance of the general line of frontage, are now in course of demolition, and the much-needed improvement of the widening of Green-street is being carried out, which have been acquired on behalf of St. Martin's Vestry by Mr. Philip E. Pilditch, surveyor, of Whitehall, will in a very short time be an accomplished fact.

METAL LETTERS FOR SHOP NAMES, &c.—Mr. John Marston (Wolverhampton) sends us a description and illustration of a new make of letter for shop names and signs, and also a set of letters, called the "Koh-i-Noor" letters, and are made of repoussé sheet copper with a convex exterior surface, which is gilt. They should show very well, and last well, and have the advantage that any single letter can be easily detached for repair or replacement. They can be fixed into the centre of a wrought-iron design with good effect.

SANITARY EXHIBITION, PARIS.—We hear that the exhibition is still by no means complete, the English section especially being in a very backward state. It is expected that it will be fully a fortnight before the exhibition is really complete.

APPOINTMENT.—Mr. T. H. Shipton, C.E., who for several years has been Division County Surveyor for part of Worcestershire, has been appointed Engineer and Surveyor to the Oldbury Urban District Council.

PUBLIC IMPROVEMENT AT MONMOUTH.—Pursuant to the request of the Corporation to borrow 19,000l. for the purpose of carrying out a combined scheme for sewage and its disposal, and the installation of electric light for public and private use in the borough, Colonel W. M. Ducat, R.E., Local Government Board Inspector, recently held a public inquiry at the Shire Hall. The machinery for generating electric energy and pumping sewage will be fixed on the River Monnow, water being the motive power, and a stand-by engine to be kept for use in case of floods. The sewage will pass through a system of pipes by gravitation to a tank in Little Chippenham, where it will be treated with chemicals, and then pumped to a purifying station on the banks of the Monnow one and a-half mile above the town. The only opposition was a petition signed by about 100 ratepayers, praying that the loan be not granted for electric lighting.

NEW ROOMS AT THE LOUVRE.—Three new galleries have been opened at the Louvre. One is for African antiquities; a second contains a fine collection of Louis Seize furniture; and the third is devoted to Mohammedan art.

BRITISH SCHOOL AT ATHENS.—At the annual meeting of the subscribers, on Wednesday, 18th inst., a reference was made to the meeting at St. James's Palace, but it does not appear that any

prospect of adequate permanent endowment is yet within sight. Subscriptions for limited periods, up to the amount of 300l. were announced; but that will not meet the case. The committee expressed their sense of the valuable services of Mr. Ernest Gardner, for the past eight years, as director of the School, an office from which he is now retiring, but he will be invited to become a member of the committee.

MEMORIAL EFFIGY, BRISTOL.—A memorial to the late Dean Elliot, in the shape of a recumbent effigy, has been placed in Bristol Cathedral. The cost of the effigy has been 500l. It is of Parian marble, of life-size, and will rest on a base of tinted marbles. The position it is to occupy is within the most eastern of the canopied recesses in the north aisle of the nave, close to the tablet already erected to the dean's memory. Mr. Forsyth was the sculptor.

ENGINEERING TRADES' REPORT.—Messrs. Matheson & Grant's half-yearly report says that the expected boom has not yet arrived and prices, which at the beginning of the year were still falling, seemed to have touched their lowest in January, and then settled into a permanent stagnation. There has, however, of late been a distinct revival in the engineering trades, which though it has as yet only slightly affected the values of coal, iron, and steel, still continues and is likely to go further. Everywhere there is a feeling that the worst of a bad time is over, and when the Parliamentary session now in progress is completed a steady and improving trade may be anticipated. In the United States there is already a marked revival. The prices of pig-iron have, during the last six months, fluctuated only within a narrow range, but during the last few weeks there has been a distinct advance, which gives promise of further improvement. The manufacture of finished iron has declined during the last few years from causes beyond those which have affected other industries. The loss of the Continental trade, through the growth of iron-works in Germany and Belgium, was followed, for similar reasons, by an almost entire cessation of the demand from the United States. Besides these changes, the growing supersession by steel and "iron," of iron produced by the puddling process has reduced the demand for almost all forms of rolled plates and bars. The centre of gravity has, in this respect, permanently altered, and though the aggregate consumption of iron and steel is increasing, and will increase further as trade improves, there is no prospect of any reaction towards a larger proportion for iron. The output capacity of the large steel works, as compared with the present demand, still keeps down prices, but the demand is increasing and prices are tending upwards. Non-phosphoric steel-making ore and pig-iron have been nearer the value of ordinary ore and pig-iron than before, and this, together with the reduced cost of coal, has enabled steel makers to endure the low values that continued into the present year. But there is already a slight change for the better; the demand for shipbuilding is increasing, and a revival of railway enterprise would give the additional stimulus which is necessary to allow some profit, at present entirely wanting, to be made. The enormous power of production in Great Britain and Germany, as well as in the United States, will probably hinder any great or sudden advance. In the United States, where, in 1893-4, the depression was even greater than in Great Britain, there has been a marked revival, and though prices, freights, and tariffs greatly hamper the recovery, the interchange between the two continents, the rise in American prices has, at any rate, postponed the competition of the United States in Europe and in distant neutral markets, of which already there have been ominous signs. A general improvement pervades almost all the numerous branches included under the heading "Mechanical Engineers," and if prices are not yet as satisfactory as manufacturers desire, the fuller employment in the factories, and the work in view, point towards an increase in the immediate future. In the electrical trades, the number of firms engaged, and their aggregate available capacity, still causes an undue competition, rendering contracts, for even important work, barely remunerative. Machine-tool-makers, while they have suffered by the dullness of the trades which employ them, have been stimulated to produce new labour-saving machines, and there is increased activity among those who furnish tools and plant for the large staple trades. The price of Portland cement in the London district has risen slightly during the last two months. At present the export cask of cement, 400 lbs. gross, is selling at 5s. 6d., and the improvement in the demand continues. The controversy is still unsettled concerning the admixture by some makers of other material in a raw state with the calcined chalk and clay, of which English cement is made.

THE SANITARY INSTITUTE.—At an examination for Inspectors of Nuisances, held at Huddersfield on Friday and Saturday, July 12 and 13, the following twenty-eight candidates were certified, as regards their sanitary knowledge, competent to discharge the duties of Inspectors of Nuisances:—R. Annakin, Harrogate; J. Barr, Kilmarnock; J. A. Cherry, Hull; W. H. Dawkins, Huddersfield; J. H. Hurrey, Scarborough; J. Eaton, Lancaster; E. Graham, Thornton; Bradford; E. W. Grant, Neath; J. Greenwood, Todmorden; W. C. Haller,

Keighley; J. G. Hindmarsh, Stockport; E. Holden, Darwen; J. B. Howard, Sheffield; H. H. Irons, Birmingham; H. L. Jaques, Newcastle-on-Tyne; C. Jepson, Darwen; W. G. Keppence, Manchester; J. B. Macadam, Bangor; R. W. Marshall, Armley, Leeds; G. T. Norman, Eccles, Manchester; A. J. Price, District Surveyor in all cases. He adopted the District Surveyor's view, and imposed a nominal fine of 5s. and 5s. costs on each defendant.

THE EAST-END DWELLINGS COMPANY.—It is announced that the directors have declared interim dividends for the half-year ending June 30 last at the rate of 4½ per cent. per annum on the preference on the ordinary shares, and that satisfactory progress has been made with the new buildings near King's Cross, which have been named "Pollard Houses" and "Winton Houses." Many of the inements in Pollard Houses are already occupied.

NEW MONUMENTAL SCULPTURE IN FRANCE.—The Municipal Council of Paris has, in conjunction with the State Government, passed a vote for the erection, somewhere on the road encircling Père Lachaise Cemetery, of M. Bartholomée's great work "Monument aux Morts," recently at the Champs de Mars Salon. The State has subscribed 30,000 francs towards this object. The monument is a honour of the "Défense Nationale," proposed by the State Government, it is expected will be erected either on the Esplanade des Invalides or in the Tuileries Garden, or possibly on the Plateau de Trévise, the highest point of the Bois de Vincennes.

THE Cimetière de l'Est a monument is to be erected to the memory of artisans who have been killed in the course of the performance of their duties in the service of the Paris Municipality. Going back to a very different order of things, we note that the monument is to be erected by Général Dumas, an officer conspicuous in the wars of Napoleon, and who was the father of Alexandre Dumas. Yet another monument is to be erected to the memory of Dr. Alphonse Guérin, the eminent surgeon; and, lastly, one to Marshal anrobert, to be executed by M. Alfred Lenoir, the sculptor of the admirable statue of Berlioz, in the square Ventimille at Paris. The pedestal of the anrobert statue will be decorated with bas-reliefs presenting three critical moments in his life, at which, at Inkermann, and at Saint-Privat.

WORKING SEWERAGE.—The Urban District Council having decided not to proceed with the scheme prepared by Mr. Radford, of Nottingham, we now commission Messrs. Taylor, Sons, and Crisp, of Westminster, to design a scheme which is to include the drainage of all except the best rural parts of the district.

THE GENERAL ELECTRIC COMPANY.—The company asks us to state that the fire which occurred their Manchester works on Friday last week will no way interfere with their business, the firm having a sufficient stock and plant in their London, Manchester, and Glasgow warehouses to carry out orders entrusted to them.

ENGLISH WINDOW-FITTINGS IN TURKEY.—We are informed that the new buildings for the "Conseil Administration de la Dette Publique Ottomane" Constantinople are to be fitted with the National Patent Improvement Company's window-sashes. It is said to be the first introduction of the sash-window in Turkey.

THE SMELLS OF PARIS.—A committee has been appointed by the Conseil-Général de la Seine to investigate the real causes of the bad smells so much complained of in Paris, and to discover some efficient remedy for them. The committee is also to consider what regulations or prohibitory measures can be taken in regard to the unwholesome manufactures the outskirts of the city.

LEGAL.

SEES UNDER THE LONDON BUILDING ACT, 1894.

SECTION 145.
At the Southwark Police-court, on the 18th inst., H. A. Hardy, of 6, Nebraska-street, Great Dover-street, S.E., and Mr. J. Malham, of 140, Roking-street, S.E., were summoned by Mr. Bernard Dicksee, District Surveyor for East Newington, for erecting a water-closet in the rear of 56, Great Dover-street, without giving notice, as required by 145. Mr. Dicksee, in his evidence, stated that June 24 he discovered the building in question had been erected. No notice having been given to him, he made inquiries, and ascertained that Mr. Hardy had executed the work for Mr. Malham, who had his own materials, he (Mr. Dicksee) therefore intended that Mr. Hardy was "the builder" and Malham "the other person causing or directing work to be executed," and that they were both liable to the penalty.

Mr. Dicksee pleaded ignorance of the fact that any notice was required. The work had been erected by the Sanitary Inspector, and they had carried out his order. Mr. Dicksee said that was his reason for taking the summonses. There appeared to be misapprehension among builders on this point. He had difficulty in getting notice from the builders in work had been ordered by the sanitary in-

spectors. He had, therefore, taken these proceedings to warn builders that notice must be given in these cases. He did not, however, wish to press for a large penalty, but thought a nominal one would be all that was necessary.

Mr. Kennedy said that it was a matter of very great importance that notice should be given to the District Surveyor in all cases. He adopted the District Surveyor's view, and imposed a nominal fine of 5s. and 5s. costs on each defendant.

Mr. W. H. Cable, of 176, Malden-road, N.W., was also summoned for doing work to 170, Great Dover-street without having given notice.

Mr. Dicksee explained that this was a similar case, but that the work ordered by the Sanitary Inspector was contrary to the Building Act, and the irregularities were now being amended.

The defendant's solicitor thought that as only two wooden walls of a water-closet had been removed and replaced with brick, the work was only a necessary repair, and exempt under Sec. 209.

Mr. Dicksee pointed out that even if the work was a necessary repair it was not exempt, as only those necessary repairs that do not affect an external or party-wall were exempt, and these walls were external.

Mr. Kennedy ruled that the work was not exempt, and that notice was necessary, and he fined the defendant 5s. and 5s. costs, as in the previous case.

Messrs. Hart Bros., of 16, Great Dover-street, were also summoned for doing work to 17, Great Dover-street without having given notice.

Mr. Dicksee stated that the work consisted of taking down and rebuilding the parapet of back wall.

Defendants pleaded ignorance of the necessity of giving notice.

Mr. Dicksee explained that a misconception might have arisen in consequence of the decision of *Briant v. Fletcher* under the Metropolitan Building Act, 1855, but that this decision had been nullified by the London Building Act, 1894.

Mr. Kennedy held that notice should have been given, but as there might have been some misconception he would only impose the same fine as in the other cases—5s., and 5s. costs.

UXBRIDGE RURAL DISTRICT COUNCIL v. WILKINSON & SON.

At the Uxbridge Petty Sessions on Monday, Messrs. Wilkinson & Son, builders, &c., of Notting Hill, who did not appear, were summoned by the Uxbridge Rural District Council for unlawfully placing timber in party-walls in two buildings erected by them at Northwood, thereby infringing By-laws Nos. 31 and 32 of the said Council.

Mr. B. Freeman, Surveyor to the Council, gave evidence to the effect that plans were submitted in the early part of the year by Messrs. Finchbeck, architects, for several pairs of houses in Hollowell-road, Northwood, and were duly approved by the Council. There was no timber in the party-walls marked on the plan. According to No. 31 of the By-laws, it was stated that no bond timber or plates were to be placed in the party-wall, or By-law 32 stated that there should be 4½ in. from the centre of the wall to the joists. The party-wall between these two houses in question is only 14 in. up to the top story. On the first and second floors the joists were put into both walls. That was an infringement of the by-laws. Witness had interviewed Mr. Wilkinson, and since the proceedings had been instituted the defendants were cutting out the joists. He was instructed to press the charge against the builders, as it was a very bad case.

The Bench also took this view, and fined the defendants the full penalty of 40s.

CAPITAL AND LABOUR.

STATE OF EMPLOYMENT IN JUNE.—According to the *Labour Gazette*, on the whole there has been an improvement during the month in the state of the labour market, and the percentage of unemployed in unions making returns has declined. The building trades continue busy. The percentage of unemployed in unions making returns remains the same as in May—viz., 2½, compared with 3½ in June, 1894. Fourteen districts have taken place in the building trade during the month.

LONDON COUNTY COUNCIL'S WORKMEN.—There is some trouble at the County Council's Works Department in Belvedere-road, where a small section of the building trade men have struck work, it is stated, some others joining with them in sympathy. It appears that the two union delegates of the Joiners' Society who work on the job were among those discharged, and their mates say they were selected because of their holding office in the union. This is denied by the Council's officials.

MEETINGS.

FRIDAY, JULY 19.
Royal Archaeological Institute.—Annual meeting (continued).

SATURDAY, JULY 20.
Architectural Association.—Visit to Stanstead Mount-fichet.

Royal Archaeological Institute.—Annual meeting (continued).

Northern Architectural Association.—Annual excursion, The Chesters.

MONDAY, JULY 22.
Royal Archaeological Institute.—Annual meeting, Scarborough (continued).

TUESDAY, JULY 23.
Royal Archaeological Institute.—Annual meeting, Scarborough (concluded).

THURSDAY, JULY 25.
Victoria Institute.—Annual meeting, 4.30 p.m.
Builders' Benevolent Institution.—Annual General Meeting of Subscribers and Donors, 3 p.m.

SATURDAY, JULY 27.
Architectural Association.—Visit to Charterhouse and Godalming. (See advt. on front page)

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

12,418.—DOOR FRAME: *A. Sharp.*—An improved door or window frame for use in concrete buildings. Consists of a wooden-cased frame whose uprights are formed so of three pieces held together by related joints. Where used for windows, a skeleton frame is fitted inside the casing.

12,952.—FLUSHING WATER: *T. Knowler.*—Relates to improvements in revolving receptacles for water-closets flushed with waste water. The receptacles are formed so that a transverse section of the interior surface of each shall be in the form of a helical curve which increases in radius towards the edge over which the water is required to be emptied. The vessel is pivoted near its centre, but is raised above the point of support, so that it revolves and empties itself automatically.

15,095.—PAVING BLOCKS: *C. Jost.*—Relates to a composition which consists of asphalt, slate, and graphite, to which petroleum residue, or other hydrocarbon, is added; to be employed in the manufacture of paving blocks, pipes, &c.

15,800.—SET SQUARE: *J. Spanton.*—This is a device for projecting shadows on drawings, and is essentially a set square, constructed so as to contain two special angles, one of which is the angle a diagonal of a cube forms with one of its edges; the other is an angle of 45 deg.

22,100.—PAINT: *A. Boul.*—A material to be used as a covering for protecting surfaces against damp, composed of a compound of Damar-Batavia gum, turpentine, china clay, and pulverised graphite.

454.—FIRE-GRATES: *S. Rostron.*—Consists in improvements to copper or wash boiler grates. A frame is fixed in the brickwork to receive a loose grid for holding the fire so that a grid may be easily replaced when burnt out. The door is detachable, and hung on a flanged frame, round which the brickwork is built.

4,675.—TRAP: *F. Smith.*—Pertains to an improved intercepting trap with sweeping eye and fresh air inlet combined. The trap is of glazed earthenware, with circular inlet and outlet. The shape of the part forming the dip may be either heart-shaped or elliptical in section. The bottom of the trap is formed with a switchback curve to reduce the possibility of stoppage.

8,812.—WATER-CLOSETS: *E. Bright.*—Deals with a water-closet, whose basin combines the shapes of the two closets generally known as the "wash-out" and the "flush-down." The flushing water is made to enter the closet obliquely, and to be concentrated so as to have a powerful scouring action on the inclined portion of the out-go nearest the water inlet.

NEW APPLICATIONS FOR LETTERS PATENT.

JULY 1.—12,628, H. Grimbleby, Pantiles, 12,639, J. Brown, Laying Floors and other Flat Surfaces, 12,639, C. Jamieson, Pipe-joints for Water-closets, Slop-sinks, &c., 12,675, J. Perisse, Heating Buildings, &c., 12,788, J. Timpon, Whitewash or Colouring Compositions.

JULY 3.—12,808, W. McIntosh, Windows and their Frames—12,811, J. Rusling, Construction and Arrangement of Dwelling-houses, and in the Land appertaining thereto.—12,814, G. Beedham, Ventilators or Air-extractors.—12,855, M. Butcher and A. Cameron, Window-sash Apparatus.—12,866, E. Phillips, Monumental stones, Gravestones, Monuments, &c.—12,873, J. Stidder, Lavatory Basins.—12,874, W. Youlton, Cements.—12,909, A. Sturges, Intercepting-trap for Discharge into Manholes.

JULY 4.—12,914, W. Frost, Door Bolts and Fasteners for Window Sashes and Casements.—12,919, W. Barracough and A. Rhodes, Fireplaces.—12,920, D. Keith, Window-sash Frames.—12,922, W. Nicol, Ventilators.—12,951, H. Wood, Manufacture of Bricks and Tiles.—12,957, J. McLachlan, Manufacture of Bricks, Blocks, Tiles, &c.

JULY 5.—13,004, L. Heinzerling, Window-sash Holder, Benches for steam power.—13,033, J. Bernheimer and T. Manger, Door Fasteners and Apparatus for operating same from a distance.

JULY 6.—13,068, A. Hawley, Window Sashes and Frames.—13,108, W. Tonks and J. Burn, Door Chain.

PROVISIONAL SPECIFICATIONS ACCEPTED.

10,090, J. Patchett, Measure Process of Mortar Analysis.—10,268, F. Richmond, Joining Lead Pipe to Iron Pipe.—10,379, J. Kirtley, Joining of Stone or Earthenware Pipes.—10,571, W. Boydell, Aluxing Doors and Gates to Brick, Stone and like Walls.—11,815, E. Bauer and F. Fried, Water Waste-Preventers for Flushing Purposes.—11,761, A. Fraser, Machinery for Cutting Wood for Builders' Laths, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

12,027, H. Dawson, Sliding and Hinged Window-sash and Door-fasteners.—12,934, A. Muirhead and G. Hackford, Artificial Stone, &c.—12,123, W. Peyton, Chimney-pot and Ventilators.—1,438, J. Köhler, Tiles.—3,970, J. Moeller, Incandescent Gas-burners.

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LONDON.—For the reconstruction of Lea Bridge, for the London County Council—
 James Ironworks, &c., &c., £12,895 5 3
 G. Double, £12,977 0 0
 W. Lunn, £11,895 5 3

LONDON.—For docking and repairs to s.s. *Barrow* for the London County Council—
 J. Stewart & Son, Ltd., £432 10 0
 James Ironworks, &c., £77 0 0
 Robinson & Dodd, £292 13 0

LONDON.—For painting bridges along the line of the northern outfall sewer, for the London County Council—
 A. E. Lymes, £1,895 0 0
 M. McCarthy, £1,850 0 0
 Vigor & Co., £3,390 0 0

LONDON.—For the supply of an elevator and conveyors at the Barking pumping-station, for the London County Council—
 J. Stewart & Son, Ltd., £893 10 0
 H. J. Coles, Ltd., £450 0 0

LONDON.—For alterations at No. 35, Hatton Garden, for Mr. W. H. Baker, Mr. Geo. Waymouth, architect, 23, Moorgate-street, E.C.—
 C. Pennack, £775 0 0
 E. Horsgood, £450 0 0

LONDON.—Accepted for alterations and alterations to 198, Grove-lane, Camberwell, S.E., for Mr. J. Bach. Messrs. Burchard & Lees, architects—
 John Han, Camberwell, £130 0 0

LONDON.—For erecting four shops in Fleet-street, West Ham, for Mr. W. Nell, Mr. George Brooks, architect, 39, Flaxman Park-road, Plaistow—
 Jones & Pearce, £4,395 0 0
 Maddison, £3,335 0 0

LONDON.—Accepted for alterations to premises, No. 11, King street, and Nos. 5 and 6, Bridge-road, Hammer-smith, W. for Messrs. A. J. Palmer & Co., Mr. Alfred Howard, surveyor, The Lutter Tennis, W.C.—
 S. Knight, Fulham, £534 0 0

LONDON.—Accepted for sanitary alterations, new drainage system, and decorative repairs at No. 4, Gloucester-terrace, Regent's Park, N.W., for Mr. John Rose Auldjo, Mr. R. Owen Alsop, architect, 37, Norfolk-street, Strand—
 C. C. Cop & Son, 127, Albany-street, N.W., £745 0 0

LONDON.—For the execution of paving works, Seward-street and Mount Mills, for the St. Luke Vestry, City-road, Mr. M. C. Mesby, surveyor, Vestry Hall, City-road, E.C.—
 J. Jackson, £1,727 17 6
 J. Mowlem & Co., £480 0 0
 A. H. Ratty, £473 0 0
 W. Griffiths, £439 0 0
 W. H. Wheeler, £483 0 0

LONDON.—For the erection of Rotherhithe Town Hall. Messrs. Murray & Foster, architects, 7, John-street, Adelphi, W.C.—
 A. Total, £8,100 0 0

F. & H. F. Higgs, £17,289 390 0
 A. White & Co., £14,875 281 0
 Balmain Bros., £17,188 901 0
 G. Gordon & Sons, £16,565 275 12
 C. Deering & Sons, £16,520 228 0
 Perry & Co., £15,995 923 0
 Walter Wallis, £15,297 128 13
 H. L. Holloway, £15,202 20 0
 H. J. Williams, £14,768 229 0

* Additional if panning to Vestry Hall be in oak.

† Saving if stonework to tunnel elevation be in artificial stone.

Accepted.

LONDON.—For the erection of house and shop, Park Avenue and Argyle-street, Mr. T. Johnson, architect, 11, East Wall, London—
 Matthew McClelland, £497 0 0
 J. A. Fulton, £45 0 0

WACLESFIELD.—For the erection of a Wesleyan chapel at Kenridge, for the Trustees, Mr. Elijah Jones, architect, Hanley—
 John Layton, Macclesfield, £1,123 0 0

MAESTEG (Wales).—For the erection of schoolrooms, &c., Nantyllyn, for the Cwmnd and Llangynydd Higher School Board. Mr. E. W. Bunn, architect, Tynfa, near Bridgend—
 W. McGaugh, £4,362 0 0
 W. Francis, £4,077 0 0
 E. Gaylard, £3,900 0 0

NEWPORT (Mon.).—For new shop and leather-dressing premises, Shaftesbury-street, Newport, for Messrs. W. W. Ware & Co., Cardiff. Messrs. Conyers, Kirby & Sons, architects, Newport—
 T. G. Diamond, £2,735 0 0
 D. Richards, £1,725 0 0
 R. G. Westcott, £1,690 0 0
 H. Bowden, £1,691 0 0

(All of Newport.)

NEWPORT (Mon.).—For new business premises, Clarence-place, for Messrs. Phillips & Sons, Brewers, Messrs. W. Graham Hitchcock & Co., architects, Newport—
 J. H. Firth, £4,780 0 0
 Jones & Son, £3,489 0 0
 Jenkins & Son, £3,470 0 0
 T. Froust, £3,287 0 0
 Locke, £3,239 0 0
 C. M. Reade, £3,189 0 0

(All of Newport.)

ROTHERHAM.—For alterations and additions to the hospital, Mr. James E. Knight, architect—
 C. N. Cox, £2,618 0 0
 Robert Snell, £2,390 0 0
 Thornton & Son, £2,395 0 0

* Accepted.

SALCOMBE (N. Devon).—For the construction of roads, for the South Devon Land Company, Limited. Mr. J. E. Clifton, surveyor, Swanton—
 Amos Jackson, £2,797 0 0
 John Crocker & Sons, £2,780 0 0

* Accepted.

SOUTH SHIELDS.—For erecting the Mortimer-road Infants' School—
 H. Brown & Co., £5,468 13 10
 W. J. Robson, £5,312 5 10
 Thornton & Co., £5,274 8 8
 P. Goodwin & Sons, £5,193 0 0
 James Young, £5,145 0 0
 Stephen Sheriff, £5,122 16 0

SOUTH SHIELDS.—Accepted for new bath-room and additions to house, 5, Wellington-terrace, for Mrs. Ward. Mr. J. Wardle, Donald, architect, South Shields—
 W. Fawcett, £142 10 0

(Lowest of four tenders.)

SOUTH SHIELDS.—For the erection of "Weston Tower" Westgate Village, for Mr. T. E. Prigman, Mr. I. Wardle, Donald, Architect, South Shields. Quantities by the architect—
 Thornton & Co., £3,326 14 0
 South Shields, £4,550 0 0
 J. C. Nichol, £4,510 0 0
 J. Williams, £4,510 0 0

* Accepted.

SOUTH SHIELDS.—Accepted for new stable and coach-house, for Mr. John Rendshaw, Mr. I. Wardle, Donald, architect, South Shields. Quantities by the architect—
 R. Goodwin & Son, £250 0 0

(Lowest of three tenders.)

STOCKPORT.—For the supply of 30 tons of setts and 500 tons of broken stone for the Rural District Council. Mr. R. H. Turner, Surveyor, Union Office, Stockport—

	Setts.	Broken Stone.
	Per ton.	Per ton.
	s.	d.
I. H. Webb, Furness Vale (accepted)	5	6
Thos. Feather, Milford (accepted)	5	7
Clee Hill Granite Co.,	11	13
Stockport Guardians of the Poor,	11	0
L. Maiden,	9	5
Whitwick Granite Co.,	10	5
Buxton Lime Works,	9	5
Enderby and Stoney Station Co.,	11	1
Glyn Granite Co.,	10	0
Kneshaw, Lupton, & Co.,	10	2
Little Orme's Head Co.,	4	7
Chundley & Co.,	10	3
I. H. Potts,	10	9
Brundrit & Co.,	10	4
Des Croyd Granite Co.,	10	6
Wardle Bros.,	10	0
D. Drinkwater,	9	1
Ireland & Knight,	2	6
Walton Bros.,	10	11
I. H. Pappas,	9	1
Narborough and Enderby Granite Co.,	11	11
H. Hays & Co.,	11	3
Hargreaves & Bolton,	11	3

SWINDON.—For alterations, &c., to mixed school building, Highworth, for the School Board. Messrs. Bishop & Pinchett, architects, Regent Circus, Swindon. Quantities by the architect—
 W. A. Wheeler, £716 10 0
 J. Thomas, £716 10 0

* Accepted.

UPPER PFOWELL (Denbigh).—For taking down and rebuilding a bridge, for the Denbighshire County Council. Mr. R. Lloyd Williams, County Surveyor, Denbigh. Quantities not supplied—
 James Davies, £345 0 0 (accepted) £754 14 0

WATFORD.—Accepted for sewerage, leveling, making-up, paving kerbing, &c., for the Watford Urban Council. Mr. D. Waterhouse, Engineer to the Board—
 F. Dupont, Watford, £1,154 0 0

WOBLEY (Hertfordshire).—For alterations and additions to the schools, for the School Board. Messrs. H. G. Giddals, architect, Hereford—
 J. J. Davies, £30 0 0
 J. J. Davies, £30 0 0

* Accepted.

W. H. Lascelles & Co.,
 121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

HIGH-CLASS JOINERY,
 LASCELLES' CONCRETE
 Architects' Designs are carried out with the greatest care.

CONSERVATORIES,
 GREENHOUSES,
 WOODEN BUILDINGS,
 Bank, Office, & Shop Fittings.

CHURCH BENCHES & PULPITS.
 ESTIMATES GIVEN ON APPLICATION.

WOKING.—For additions and alterations to "The Vines," St. John's, Woking. Messrs. Murray & Foster, architects, Adelphi Chambers, London, W.C.—
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VOL. LXIX No. 2738.

JULY 27, 1895.

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Stafford County Infirmary, as Remodelled.—Mr. Aston Webb, F.R.I.B.A., Architect	Double-Page Photo-Litho.
Residence at Haslemere, Surrey.—Mr. G. A. Hall, A.R.I.B.A., Architect	Single-Page Photo-Litho.
No. 51, Harley-street, W.—Mr. F. M. Elgodd, A.R.I.B.A., Architect	Single-Page Photo-Litho.

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Perrot and Chipiez' "Primitive Greece."



THE authors of this large and rather rambling book, which now appears, like its predecessors of the series, in an English translation, have in their previous treatises on various chapters of ancient art always put before their minds Greek art as the goal towards which they were tending. As yet, they say by a rather happy metaphor, we have seen Greece "only in profile and from the outside," though some of their former works have led them to deal with art as late as that of the complete Greek epoch. They now to retrace their steps chronologically, and follow the direct line of Greek art up to its commencement, in order to deal systematically with the subject, and trace the history of the development of Greek art in a continuous manner. Accordingly these two rather formidable volumes, comprising together more than a thousand pages, prelude to the work on the complete art of Greece, and deal with the art of the prehistoric period, or what the writers distinguish in their sub-title as "Mycenæan Art," the translator gives it; we should have thought "Mycenæan" more correct. Whether the view of the authors is that the primitive art of Greece belongs to a time when Mycenæ was the central city of the peninsula, or whether, on their scheme, there are all other phases of primitive Greek art to be dealt with before we emerge into Greek proper, we do not quite gather; but if primitive or early Athenian art is also to be the object of as large a treatise, the subject will swell to rather a formidable size. That the interest of Greek art, and the multiplicity of the subject, are almost endless, we quite see, but that is exactly a reason why, in treatment of it, prolixity and excursiveness should have been avoided. There is much that is very interesting in MM. Perrot and Chipiez' new volumes, but they are needlessly lengthy and verbose, and contain a great deal which has little to do with the history of Greek art, even were it history at

all, and not, as in some instances, pure conjecture, or with only just the slightest basis of historical fact or suggestion.

In their long dissertation on the country and the people, which we must, for the most part, pass over, the authors make some good points in regard to the influence of the nature and configuration of the country on the development of Greek society and character. The relief of the ground, and its being split up into fragments (in other words, we presume, the highly-indented nature of the coast of Greece) brought the *oikias* into being; in days when methods of locomotion were not very highly developed, the growth of separate small states, each dependent on its own capital city, was a natural result; had Greece been a flat plain, her social and political constitution might have been very different. The extent of coast-line, too, which brought so large a proportion of the inhabitants into direct contact with the sea, must have had a great influence, both on the physical characteristics and mental development of the Peloponnesians, who obtained, as Swinburne finely says of the Athenians—

"Friendship and Fame of the Sea"; and the plenteousness of marble in the peninsula was undoubtedly, in another sense, an element in making Greek sculpture and architecture what they eventually became; the material must have actually influenced the art to a considerable extent. These are points in the authors' long and not very connected or symmetrical chapters on the country and the people, in which they appear to aim at making a complete philosophy of the genesis of Greek art from surrounding circumstances. Reflections of this kind are not without interest, for those who have time for them, but they do not prove much. As this treatise, however, is we presume, we will not say for "popular," but for general reading, rather than for scholars, the authors have done well in emphasising the fact, recognised now by all students of Greek art and history, that Greeks and Greek art had their barbarous period; that the reader must make an effort to realise that there was a time when the Hellenes were mere savages; "the tribes whose manners and daily life we may guess from the lower strata of dwellings at Hissarlik and Tiryns, must have greatly resembled those which modern travellers found settled in the islands of the Pacific; the implements of both are

nearly identical, and answer to a similar social grade." This, of course, is what mere common-sense would lead one to expect, only people are a good deal in the habit of forgetting it, and thinking of Hellenic art only as it was in its later development. Possibly, on the other hand, too much may be made of the interest which is supposed to attach to the rudest and most primitive idols of early Hellenic make; and when the authors ask the readers whether their love of Greece "is great enough and deep enough to stand the test of accepting with reverence all that comes from her hand, finding nothing amiss as they listen, bent over her cradle, to the first babble of her genius," we are reminded how we once heard a learned archæologist solemnly inform his audience, at a meeting of the Hellenic Society, that So-and-so (we forget the name) "was believed to be the first artist who made a distinction in his works between the figures of men and women." This is surely going a little too far back in history for anything that can rightly be called "art."

In considering the localities of early Greek history, the authors commence with the island of Thera (now known as Santorin), and then proceed to devote a considerable space to Troy, or Hissarlik, for they use the names interchangeably, adopting the view that Hissarlik was really the site of the Troy of Homer, though admitting, of course, that there is little in common between this small citadel and the Homeric Troy, which they regard as a poetic embellishment of the real site. Many pages are occupied, to little purpose as it seems to us, in theorising upon this subject of the reconciliation of Hissarlik with the Homeric narrative; a question which has nothing to do with the main purport of the volume. The Homeric Troy was a purely ideal place; the Hissarlik ruins afford no adequate basis for it, and the speculation in this sense is an idle one. What is to the purpose is that in Hissarlik we have remains of a citadel or fortified hamlet going back to the earliest age of Hellenic history; and in this respect the authors give a very complete account of it, and a plan showing the relation of the remains of the three periods to which Dr. Dörpfeld has reduced Schliemann's seven strata. They give full consideration to Boetticher's necropolis theory of Hissarlik, and dismiss it rightly as untenable. The place was

"History of Art in Primitive Greece: Mycenæan Art," in the French of Georges Perrot and Charles Chipiez. London: Chapman & Hall, 1894.



Slab-circle around Burying-ground, Mycenæ. From Perrot and Chipiez' "Art in Primitive Greece."

a place of the living, not of the dead. Apart from the mere hypothetical considerations as to Homer's Troy, the chapters devoted to Hissarlik form an excellent summary of the information gained, comprised within a comparatively short space. The authors next take us to Tiryns, which is very fully described and illustrated, and thence to Mycenæ. In regard to the double circle of slabs surrounding the burial-ground discovered by Schliemann, the authors apparently evade the question as to the reason for this singular fence of two walls of slabs in concentric line, accompanied by remains of horizontal slabs secured by mortising. They say "the intervening space between them was filled with earth and rubble; and the slabs, which are now the only remaining part of the erection, formed the lining to both sides of the wall, whilst the covering units prevented outward thrust"; but it is difficult to judge, from the manner in which the observation is introduced, whether or not this is intended as an assertion in regard to the original construction of the wall, or a description of the state in which it was found. In any case, some attempt should surely have been made to explain this construction of double rows of slabs, so different from anything found elsewhere in the pre-historic remains of Grecian construction. Was any filling found between the rows of slabs which appeared to have been an original filling, or were they only filled with rubbish and debris which had fallen in or accumulated? We should certainly have looked, in a treatise of this kind, for some theory or suggestion as to the intent of such a construction; and we look in vain. If this fence was intended merely as a fence, why construct it in that manner, when walls built in one thickness of rough-hewn blocks are found in immediate conjunction with it? There was a reason other than the formation of a mere fence for these concentric slab-walls; no one who looks at the drawing of them as they now exist can think otherwise; and it is, to say the least, curious that authors who are so much given to theorising on other matters, with far less basis for it, should pass over this peculiar feature as a

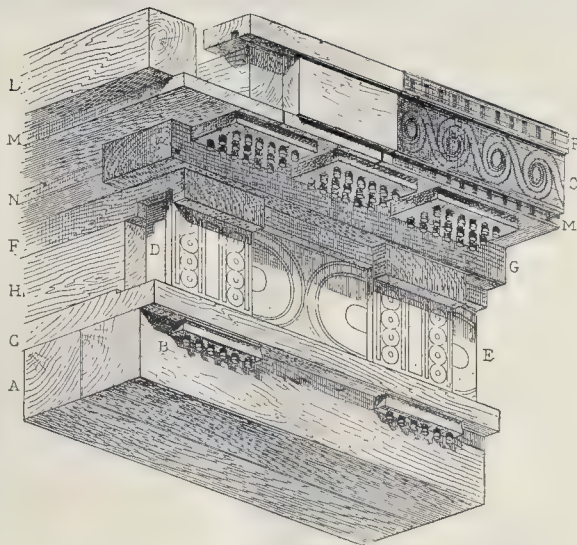
matter of course, and without any really definite or intelligible description of the state in which it was actually found, or of the conclusions to be drawn as to its original construction and object.

In the description and illustration of the so-called Treasury of Atreus the authors are much fuller and more explicit, and this famous construction is very fully treated and illustrated, and in the second volume a fine restoration of the interior and of one of the portals, by M. Chipiez, is given; the interior is not an improbable restoration in appearance; in the portal we think M. Chipiez' fancy has run away with him considerably in regard to the amount and elaboration of the decorative detail. In the interior of the dome, the small holes found all over the surface have been taken as suggestions for a metal ornament inserted, which has been taken as a rosette, on the authority of an ivory comb, where such a form appears as an ornament between two sphinxes. This is going rather far afield for detail for the building, but it must be remembered that in archaic art we generally find a very few types of ornament which are constantly repeated, so that the suggestion is not without its probability.

In the restorations of Mycenaean architecture, however, the authors give full play to their fancy in the usual manner of French restorers. They have evolved a whole architecture, divided into first, second, and third epochs, out of the inverted column and its primitive entablature carved on the lion gate, and various bits of carved decoration from different sources. In regard to the entrance-portal of the Treasury of Athens there is a curious example of the off-hand manner in which fact and fancy are mixed up by French and German architectural restorers. In the drawing given of this doorway (vol. ii, plate iv.), labelled "Present state of façade, after Fr. Thiersch," there is a capital, and a small portion of an inverted column with a zigzag ornament, shown on the left of the doorway. But a page or two further on we read, "The capitals are gone, but the position which they occupied is so well determined that M. Thiersch did not hesitate to intro-

duce one of the capitals in question in his sketch entitled *Present State*. We have followed his example" (1). That is certainly one way of getting materials for a restoration. The bases of the columns exist, and are shown as tapering the wrong way, as in the column on the lion's gate; but after what we have just quoted one is led to ask, is this a fact, or is this only the way M. Thiersch or M. Chipiez think they probably were? The authors should have given an illustration of the remains from a photograph; that is the only form of book illustration which is worth much in an argument of this kind. As to the elaborate drawings of the several epochs of Mycenaean architecture, the production of them has no doubt been a very interesting kind of study to their author, but except as to the form of various small details of ornament which have been discovered, they are mere fanciful conjecture; they are shown in fine plates, which are an ornament to the book, but we cannot see that this kind of production has much to do with the history of Greek art. The disadvantage of these fanciful restoration plates is that, though the reader who knows what is the extent of actual material on which they are based is not carried captive by them, and merely regards them as an interesting form of architectural recreation, it is not so with the less-informed class of readers, who are apt to suppose that elaborate designs, labelled "first epoch," "second epoch," &c., and made out in all their details, must be based upon actual knowledge; and so fiction gets mistaken for and accepted as fact.

We feel more interest in M. Chipiez' restorations of the general aspect of Mycenæ, of which two views are given. Here we are not asked to accept on faith such a quantity of detail as appears in the restored drawings of separate buildings; it is the general aspect of the ancient walled town, so great in its historic name and associations, so small in its area compared with a modern city, which it is endeavoured to revive; and there is something in this sketch of the place, with the mountain overshadowing it, which appeals strongly to the imagi-



Wooden Entablature of Mycenæ: as Restored by MM. Perrot and Chipiez.

nation, and seems for a moment to bring us back into the Homeric world.

The most interesting chapter in the book to architects is, or ought to be, that in which the authors' attempt to settle no less a question than "the origin of Doric architecture," on the basis of various points in Mycænæan remains. But, unfortunately, we find the old logical fallacy, so familiar to all students of French architectural books, by which constructions which have been evolved mainly out of a process of theorising on a clever manipulation of a few facts, are, in turn, treated as facts, and used as the basis to build a fresh theory on. Having evolved three epochs of Mycænæan orders, with entablature and details complete, to their satisfaction, the authors proceed to give enlarged details of their own restored construction, showing the whole process of mortising and the application of wooden pegs to hold the pieces together. They produce a piece of an alabaster frieze with some decorative design on it: this is an actual find of Schliemann's, and may be probably assumed to have occupied the place of a frieze, that is to say, a continuous wide band of ornament running along the top of some construction. The authors then show, in the plate referred to, how all the treatment of the various wooden portions of the entablature (their own invention) is exactly suited to hold up and keep in its place an alabaster frieze of this description. Then we have a drawing of the complete entablature with the alabaster frieze fixed in it, and then comes the crowning triumph of the argument: when we take an early Doric entablature, such as that of one of the temples at Selinonte, we find (*mirabile dictu!*) that all the parts, except the triglyphs and metope sculpture, exactly represent the authors' wooden Mycænæan entablature, evolved out of their inner consciousness by a process of shrewd and acute reasoning. It is really wonderful; such a remarkable tribute to their insight and perception! Only, is not this triumphant result just a little discounted by the fact that the authors knew all about the details of the Selinonte entablature beforehand, and had only to work up to them? The idea of going through all this inductive argument, as if it were on perfectly abstract grounds, and then producing at the end of it the illustration of the stone entablature to which they have been leading up as a foregone conclusion, has, at all events, the merit of unconscious humour.

That there is a great deal of cleverness in

the working out of the imaginary wooden details and construction of the Mycænæan architecture we willingly concede, and it may be taken as affording some new suggestions as to the manner in which the Doric stone entablature evolved itself from a wooden construction, if it did so evolve itself. Although, in common with most writers on the subject, we consider its wooden origin highly probable, or perhaps something more than probable, it is just as well to remind people that it is not *proved*, and that there is still room for a difference of opinion on the subject. It is unlikely that anything will be discovered now which will render it absolutely certain, or will explain exactly the stages of the transition from wood to stone, because for that we want remains of the intermediate wooden constructions, which have all perished. MM. Perrot and Chipiez have endeavoured to supply an intermediary stage, and in a manner which is very ingenious, but while giving them full credit for that, let it be borne in mind that it is absolutely nothing but theorising.

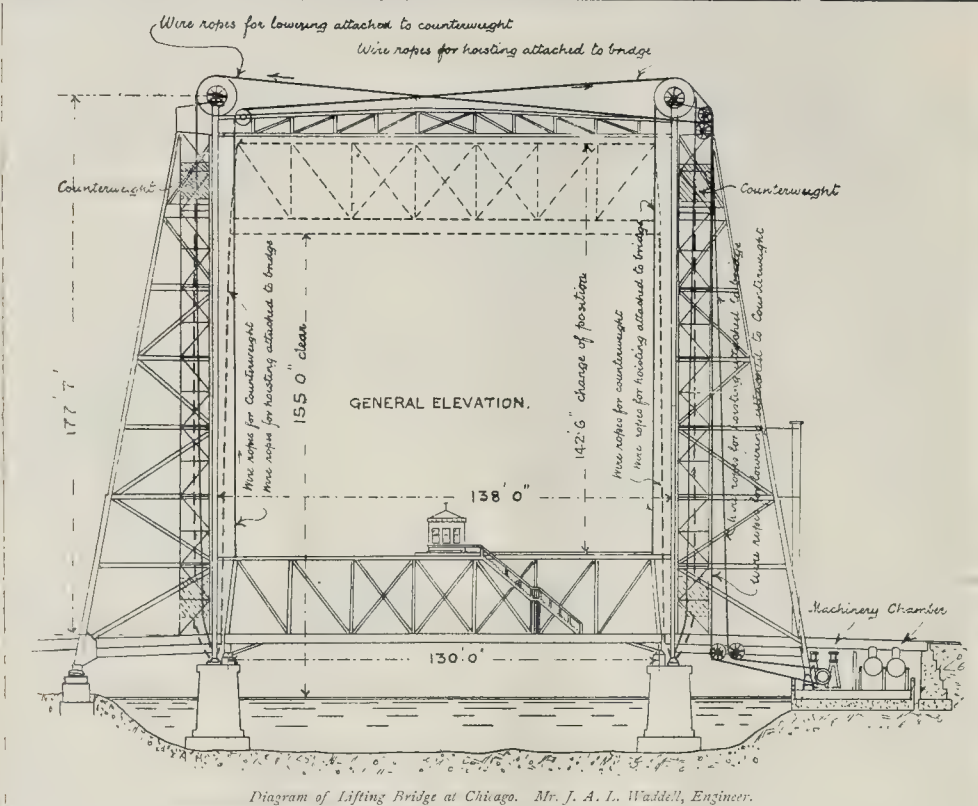
There are two or three points in the theory, moreover, which seem to call for special comment. We have already referred to the rather small basis on which the authors have imagined a whole architecture of what we should call inverted columns—*i.e.*, columns with the thicker end uppermost. Now, confining the matter to the Mycænæan architecture, is it even so certain that the carved column on the lion gate, which is the chief fact we have to go upon, is after all a representation of a column and an entablature? Is it not possible that it represents something in the nature of an altar, for which the support might be in a special shape? Is it not rather improbable that a columned architecture would be represented in sculpture by a *single* column? And is it not in accordance with constant practice in antique sculpture, medals, or paintings, that two symbolic animals are represented on each side, not of a building, but of an altar or sacred symbol of some kind? There seems to us to be quite as much probability in this view of the lion gate sculpture as in that which regards it as a representation of the architectural columnar "order" of the period. But supposing this is not so; supposing that we accept the Mycænæan inverted column as the common form of support in the Greek architecture of that date and neighbourhood, we should like to know what becomes of it in the Doric period. If we are to accept the authors' theory, that the Doric entablature is

derived from a Mycænæan wooden entablature, why was the inverted column not accepted also? Why are we to suppose that there was continuity of development in the entablature, and not in the column? This is a point which seems quite to have escaped the authors in considering the "origin of Doric architecture," in which the column, æsthetically, is even more important than the entablature; and if they wish us to believe that the Doric entablature was derived from their Mycænæan entablature, they must either explain away their inverted Mycænæan column, or they must explain what became of it in later times. Another point to be noticed is in regard to the pegs which are given in the imaginary Mycænæan entablature as the origin of the *gutta*. While the authors are looking for the *gutta* in a purely imaginary piece of construction of their own, they have overlooked a fact bearing on the point in one of their own illustrations. On the chromolithograph plate facing page 225 in the second volume is an illustration of a dagger with the hilt ornamented with circular studs of exactly the shape and proportions of the Doric *gutta*, showing even the characteristic thickening out towards the extremity of the projection. As the authors have built so much, in other parts of their book, on stray bits of ornament found in isolated objects, it is odd that they should have overlooked the suggestion in this dagger hilt.

There is a great deal of information on other points summed up in the book, on stone implements, early statues and idols, metal-work (a very good chapter), representations of the figure, &c., and though it is all mingled with a good deal of fancy and theorising, there is something of interest to be found in most chapters of the book, and the number of illustrations adds very much to its value. We regret that the translation presents the same defects to which we have already called attention in the English editions of previous works of the series by the same authors. Bad grammar is frequently met with (*ex gr.*: page 8, "these types owe to their noble character and infinite breadth to have outlived the old world and of imposing themselves on modern plastic art"); and the translator still indulges the bad and clumsy practice of translating (?) French technical words which he does not understand by simply writing the same word in an English form. Thus we have "plat-band" (*plate-bande*), an expression which has no existence and no meaning in English, and we are told that one detail has a "gauffred-like appearance," and we read of "necropolises" and "acropolises." Achilles is always spelt "Achilles"; Pnyx, on the other hand, by an opposite mistake, is written "Pnix"; and we have "Selinous" for "Selinus." All this is very careless and clumsy; such blunders, though they do not affect the main value of a book, are great blemishes in a handsome and costly publication, and the publishers would do well on the next occasion to get some one with a better knowledge of English and of architectural terms, to correct the vagaries of their translator.

AN AMERICAN LIFTING BRIDGE.

IT will be remembered that the design for the new bridge over the Thames near the Tower of London was only selected after the most careful consideration of the various schemes for affording additional facilities for crossing the river at this point. Great differences of opinion existed as to the most desirable manner of providing further means of communication between the two banks of the river, the solution of the problem being made especially difficult owing to the important shipping interests involved, and it was not until the merits and defects of many proposals were fully examined, that it was decided to construct the bascule bridge, which has so recently been completed. The bridge has now been in use for one year, and the manner in which it has ful-



filled the expectations of those responsible for its construction, leaves nothing to be desired.* In fact, it must be confessed that, with regard to accommodating both the river and road traffic, the bridge has worked even better than its most sanguine advocates had anticipated. The process of opening and shutting the central span to permit vessels to pass through the bridge is performed so rapidly, that it has been found unnecessary to use the hydraulic lifts for conveying passengers to the high-level footways, it being generally quicker to wait at the lower level until the operation of allowing a ship to go through is completed. The maintenance of such a structure is, as might be expected, a very heavy expense, it being necessary to employ a large number of men to attend to the machinery, and for other purposes connected with the efficient working of the bridge, but this outlay, as well as that incurred in carrying out a somewhat elaborate and difficult piece of work, is not a very important matter when considered in conjunction with the absolute necessity of dealing with the enormous traffic in the best possible manner.

Much attention having been given to this subject, it is interesting to observe the efforts of others to overcome the difficulties we have ourselves experienced, and an excellent opportunity of doing this is given us by Mr. J. A. L. Waddell, who recently read an interesting paper before the American Society of Civil Engineers on a bridge he has lately constructed over the river at Chicago.

This bridge has been specially designed to offer the minimum obstruction to vessels, while at the same time affording a means of crossing the river for both vehicular and pedestrian traffic. As will be seen from our

illustration, the bridge consists of one span, 130 ft. in length, designed to carry a double-line tramway, as well as vehicles and foot passengers. The roadway has a clear width of 34 ft., and the footways, which are each 7 ft. wide, are carried along the outside of the main girders. This span is so constructed and supported as to permit of being lifted vertically to a height of 155 ft. above mean low water, thus allowing all kinds of vessels to pass beneath it. When the bridge is in its lowest position, that is, when ready for the road traffic, the clearance afforded above the water level is 15 ft., and this is generally found sufficient for ordinary purposes.

The complete weight of this span is 290 tons, and the manner in which it is raised and lowered is briefly as follows. On either side of the river a strong steel tower has been constructed, 217 ft. in height, and on the top of these are placed four built-up steel and cast-iron sheaves, 12 ft. in diameter, supported on 12-in. axles. Eight steel-wire ropes, $1\frac{1}{2}$ in. diameter, are connected to each end of the main girders of the moving span, and passing over the sheaves above mentioned, are attached to cast-iron weights, capable of moving vertically between guiding frames fixed to the towers. This loading is just sufficient to counterbalance the weight of the span, and is therefore about 290 tons, so that the total weight of the moving mass, including ropes, may be assumed to be practically 600 tons.

Each tower consists of two vertical and two inclined legs, thoroughly braced together, the former acting as guides for rollers attached to the moving span, which is thus steadied both longitudinally and transversely. Light steel lattice girders connect the tops of the towers together and form a gangway for the men in attendance.

The lifting machinery consists of two 70 h.p. steam-engines, communicating power

to an 8-in. horizontal shaft, carrying two spiral grooved cast-iron drums 6 ft. in diameter.

In addition to the $1\frac{1}{2}$ -in. diameter ropes mentioned above, there are eight others $\frac{3}{4}$ in. diameter which are attached to the ends of the main girders and used for raising and lowering the bridge, which operation can be effected in about half-a-minute. In order to prevent any sudden jar owing to the motion of the span being checked too quickly, hydraulic buffers have been fixed both at the foot and the top of the towers. Besides the steam-lifting machinery, there is a man-power operating apparatus of simple design, which, when used alone, is capable of slowly opening and shutting the bridge. In order to secure a correct balance, water tanks are attached to the span. These also provide a quick and efficient means of raising and lowering the span in case of a breakdown of the machinery, since by regulating the quantity of water in these tanks the span could be made to ascend or descend as required.

The bridge appears to have worked well since it was opened, and is said to give better satisfaction to both navigation interests and to the general public than any other bridge over the Chicago river, although the cost of maintenance is rather a formidable expense. Its total cost, including approaches and machinery-house, was about 40,000*l.*, but owing to the previous want of experience with structures of this kind, this price is probably a little more than that which a similar bridge could now be made for.

On one occasion, owing to the main driving pinions on the crank-shaft of the engine breaking, the span remained at the top of the towers for a period of thirty-six hours, until the repairs were completed, and the bridge again put into operation; but this appears to be the only instance of the traffic being seriously interrupted.

* We are here speaking of the bridge, of course, purely as an engineering work, and without any reference to its "design" in the architectural sense.

The only other bridge of this kind was built some ten years ago for the purpose of carrying a double line of railway over the Erie Canal at Syracuse, N.Y., but the time which has elapsed since its construction and the building of the present bridge would seem to indicate that engineers are not very much in favour of this type of construction. As is well known, the life of steel-wire ropes, which are continually subjected to the reversal of stress, caused by passing over pulleys, is not of very long duration, and in the case of the Chicago bridge, where there is some 14,000 lineal feet of such ropes, the expense attending their renewal will be very considerable.

In the discussion which followed Mr. Waddell's paper on this bridge, it was pointed out by several engineers that the great difficulty experienced with bascule bridges is that of securely fixing the roadway to the moving leaves, so that when these are swung from a horizontal to a vertical position the roadway is not affected.

No trouble has, however, been experienced in this respect at the Tower Bridge, where wooden blocks are used for forming the roadway over the bascule portion, as well as along the side spans and approaches. These blocks are tenoned together and securely screwed down to greenheart planking, which is rigidly fixed to the steelwork, and after being in continual use for twelve months they appear to be in as good condition as when first laid down.

It appears that several other bridges on the same principle as Mr. Waddell's are now being designed for various places in America, but we do not think this system is likely to find much favour with us, especially as it has now been demonstrated that a bascule bridge so successfully meets the requirements of both road and river traffic.

NOTES.

THE recent appeal for funds towards the repair and making safe of the west front of Peterborough has unhappily been quickly followed by a similar appeal in respect of another great Mediaeval monument of equal importance, and one in which there is perhaps a stronger popular interest. Salisbury spire is evidently in serious danger. We reprint on another page Sir Arthur Blomfield's report, which was communicated to the *Times* of Saturday last, accompanied by a letter from the Dean of Salisbury to the effect that the funds officially available are as inadequate as the substructure of the spire appears to be. Sir Arthur Blomfield estimates the cost of the repairs which are absolutely necessary to render the tower and spire safe as probably about 5,000*l.* Towards this the Cathedral authorities have only the prospect of being able to supply 1,300*l.* in two years. It is evident that delay will be dangerous, that the work of repair ought to be begun at once, and that it is imperative that the funds should be found. Many persons, we are quite certain, will agree with us that in the case of a monument of such national importance as this, public money ought to be forthcoming if the funds cannot be obtained through private liberality. In France this would be the case almost as a matter of course, for the French, though they "restore" their ancient architectural monuments too much, at all events appreciate their national importance, and do not grudge the employment of public money in repairing and preserving them. It is high time that this example were followed in England, and that our Government should recognise that great architectural monuments of the past are a part of the most precious possessions of the nation, and that a duty to posterity lies upon us to preserve them from ruin. The loss of Salisbury spire, through want of money to pay for the work necessary to ensure its safety, would be not only a national misfortune, but a national disgrace.

WITH the General Election, from a political point of view, we have nothing to do. But it is important to note the attitude and fate of the so-called Independent Labour Party. This party must be regarded really as a Socialist labour party, and it is clear that it has no real hold of the bulk of the working-classes. Its candidates have polled a very small number of votes compared to those given for the two main political parties. Those who are most active in connexion with this party are also prominent in expressing the views of the labour party in the press. The absolute defeat of this party at the polls seems to show that the anti-capitalist attitude of the most extreme of the advocates of the working-man does not meet with the sympathy of the bulk of the working-classes. We hope that this is indicative of the fact that more cordial relations exist between employers and employed than labour orators are apt to suppose.

THE "Journal of the Institute of Architects" (No. 17) contains an account of a deputation to the Bridges Committee of the London County Council on the subject of the new Vauxhall Bridge. The deputation consisted of Mr. Waterhouse, Sir A. Blomfield, Mr. Brydon, Mr. Caröe, Mr. Romaine-Walker, and Mr. Mountford. They laid before the Bridges Committee drawings showing the design prepared by the Art Committee of the Institute for the new bridge, and sanctioned by the Council of the Institute. Mr. Waterhouse explained that they desired to interfere as little as possible with the design for the ironwork prepared by the engineer to the County Council, but they had increased the width of the stone piers from 12½ ft. to 17 ft., as they considered this width necessary to give the bridge a sufficiently monumental appearance; and they corbelled out the footpath, partly to reduce cost, partly to give a sufficient degree of shadow on the ironwork beneath. This is a doubtful arrangement. The Art Committee propose to reproduce "in a somewhat more solid shape" the characteristic design of the balustrade over the existing bridge, and certainly it is well worth reproducing, but it will have a very different effect when placed on a corbelled-out footpath from what it has on the present bridge, where it is the finish, perpendicularly, of the bridge design. The Committee also suggested that Portland stone might be used above the water-line instead of granite, as more pleasing in appearance as well as more economical. As the homogeneous character of the bridge as a whole is already destroyed by the introduction of iron, it does not seem to be of much consequence if the homogeneous character of the piers also is destroyed. Such a structure as is intended can never be monumental, and the corbeling out of the footpath will make it even less so than it might have been. The Chairman of the Bridges Committee feared that the Conservators of the Thames would never allow the proposed increase of width in the piers. Are the Conservators masters of the situation? It seems rather odd that they should be supposed to have absolute power in regard to such a matter as the design and construction of the piers of a bridge.

THE work in the 1895 National Competition of Schools of Art is at present exhibited at South Kensington, in the iron building adjoining the Machinery Section, Southern Galleries, Exhibition Road. It is an interesting collection, which shows the sort of work that the examiners consider worthy of reward, but the excellence varies considerably, from a few good things to a considerable number which are of very commonplace character. The exhibits comprise specimens of modelling in all its branches, drawing from the antique figure and from the living model, figure-painting from the nude and from the antique cast, painting from still life, and ornament in

monochrome. There are also many designs for textiles, laces, carpets, hangings, drapery, wall-papers, internal decoration, stained glass, historic ornament, pottery, tiles, ironwork, and book illustrations. As usual, architectural design is not well represented in the "National" competition, the results of which are exhibited at South Kensington, and the strictures on the work which appear in the report of the judges, Messrs. Aitchison, T. G. Jackson, and J. J. Stevenson, appear to be fully deserved. The work of Mr. Charles Quennell, of Lambeth, is awarded a gold medal; this design for an art gallery appeared in last year's competition for the Soane Medallion. The planning appears to be crude in its arrangement, and the interior decoration is remarkable in character and out of scale. There are some good points about the elevations. Mr. A. H. Hodge, of Glasgow, has received a silver medal for his design for an Art Garden; the drawings show considerable imagination of and a feeling for colour, but the design as a whole represents a most impossible piece of architecture. Mr. E. F. Reynolds takes a silver medal for a design for a river-side warehouse, to which one turns with much pleasure. The work of Mr. T. A. Williams, of Chester, also well deserves a silver medal for a design for a memorial church. Architectural sketches are well represented by Mr. G. H. Lenfety's work, holiday sketches in Normandy and Brittany, which receive a gold medal. Mr. R. I. Beale takes a bronze medal with some interesting sketches of a Jacobean pulpit. Mr. Beale shows considerable perception of light and shade, and in this respect his work is good. Architectural drawings from measurement of actual work comprise some rather ordinary work, from which Mr. J. T. Walker's drawings of St. Mary's Church, Banbury, have been selected for a silver medal. The architectural work as a whole does not arouse our admiration to any extent, and if the work exhibited here is representative of the South Kensington methods of teaching architecture, the sooner those methods are improved the better. Space permits only brief reference to objects in other departments of the exhibition. Mr. G. J. Carder exhibits a picture-frame of oak, with white gesso decoration, which deservedly receives a silver medal; another is flanked by book-cover with gesso decoration, which receive bronze medals; these are capital designs and worth study. Mr. Charles Lawford, of Leicester, exhibits an excellent design for a Brussels stair carpet, which has received a silver medal; we should like to see Brussels carpets of moderate price and equally good design more easily obtainable. The rest of the exhibition contains work of varying excellence. The architectural section of this exhibition seems to contain the least satisfactory work.

THERE are so many buildings in London and other large cities which depend for their stability upon a metal framework, that experiments carried out with a view to ascertain the effects of a fire upon the iron or steelwork of which they are composed cannot fail to be of very great interest to all who are responsible for structures of this character. Experiments were made a short time ago at Vienna, under the supervision of the City Surveyor, with the object of testing the efficiency of various building materials against fire, and also to ascertain what protection they were capable of affording to ironwork. To make these tests a brick chamber some 12 ft. by 8 ft. in plan and 11½ ft. high was built, and in the centre an iron column was constructed consisting of two channel-bars, 5½ in. by 2½ in. These channels were placed 2½ in. apart, back to back, and were braced together with light lattice-bars. Within the space between the channels test-bars, composed of various alloys melting at temperatures between 150 deg. Fahr. and 1,650 deg. Fahr., were placed, the column afterwards being

surrounded with brickwork in mortar, thus forming a pier some 18 in. square. In order that the test should be nearly as possible resemble the conditions met with in actual practice, the column was loaded with a sufficient weight to cause a stress of $3\frac{1}{2}$ tons per square inch on the ironwork. Fuel was then strewed over the floor of the chamber to a depth of some 3 ft., and the firing was fully maintained for a space of $2\frac{1}{2}$ hours, and was subsequently extinguished by the fire brigade. The heat had, however, been so great that it was not until the next day that a thorough examination of its effect could be made, but it was then discovered that although the edges of the brickwork pier were crumbled to an extent of $1\frac{1}{2}$ in., the iron column was quite uninjured, and only the test-bar, capable of fusing at 150 deg. Fahr., showed any indication of melting. It would thus appear that the brickwork was of ample thickness to protect the ironwork, and that when such construction is adopted in actual practice a building is probably as fire-proof as it is possible to make it.

THE demolitions that have been made in course of the past few years in Austin Friars will shortly be followed by the removal of Nos. 10, 11, and 63. These stand on nearly 5,000 ft. super., with a frontage to Austin Friars-square, of which they form the west side. Nos. 10 and 11, built of red brick, afford good plain examples of the genuine Queen Anne style. The former has a date "1704" on the rain-pipe; it is entered by a flight of steps, the wide and handsome staircase is panelled, and has a painted ceiling; No. 11, also gained by steps, is distinguished by a carved doorway. Close by is the site of the old mansion, with its terraced garden, which belonged to the Dutch trader Herman Olmuis, or Van Olm (1705-18), and his younger daughter's descendants by her marriage with Adrian Lernout,* to the demolition of which we adverted in a "Note" on March 3, 1888. The removal of No. 36, Bishopsgate-street Within, will give opportunity for improving the approach into Great St. Helen's; it is, perhaps, a contemporary of the house, Crosby Hall Chambers, which has been supplanted by the nearly completed premises which have been built by Messrs. Colls & Sons, after Mr. W. Gwyther's designs, for the Bank of Scotland. The inner front of the Chambers had an elevation of a rustic ground floor, with pilasters on the first floor; a design that has been attributed to Inigo Jones and is illustrated in the Rev. Thomas Hugo's "Itinerary of the Ward of Bishopsgate," 1862. We are informed that in the new building will be preserved the fine Jacobean chimneypiece of stone and carved wood, bearing in its central panel, the initials and date "G. B., 1633."

THE painting by Holbein, which it has been stated the Barbers' Company are willing to sell for 15,000l., will shortly be deposited for public inspection in the Guildhall Art Gallery. It now hangs, together with other notable pictures, in the Company's Court Room, or Parlour, an apartment that was built *circa* 1636, after Inigo Jones's designs, but suffered some damage in the Great Fire. The Livery Hall was pulled down some years since; its stone doorway, by Jones, was, however, refixed in the new gateway. Thirty years ago the Parlour was redecorated under the superintendence of Mr. C. J. Shoppee, who constructed the lantern-light in place of the cupola that had been erected in or about 1752, and was again decorated in 1878 by Mr. C. Herbert Shoppee. The famous picture, executed on a gilt ground, on oak panel, represents King Henry VIII. in the act of committing to Thomas Vicary, Master, a new charter for uniting the Chirurgeons and Barbers in

one corporation, 1541. It contains portraits of several celebrities, amongst them being Dr. Butts, Dr. Chamber, Warden of Merton College, Oxford, Dean of St. Stephen's, Westminster, and principal physician to the King; James Mumford, "King's Surgeon"; Nicholas Symson and Edward Harman, "King's Barbers"; and Sir John Ayliffe, whom Edward VI. knighted—he also was a "King's Surgeon." The silver-gilt Grace cup and cover, with four pendant bells, given by the King in celebration of the event, is considered by many to display the influence of Holbein. The Company possess the copper-plate, by Bernard Baron, of the picture. They paid him 150 guineas (1735); impressions of the plate were sold by T. Bowles at half-a-guinea each. For some of the foregoing particulars we are indebted to an account written by Mr. C. J. Shoppee, some time the Company's architect and surveyor, and Master in 1878.

WE heard of an amusing instance the other day of the way in which some of the public regard the work of an architect. A lady who thought of building called at a publishers to procure a book on dwelling-houses, and having found a book of designs and plans by an architect, which was much to her satisfaction, stated her intention of calling on the author of the book to talk to him further about the proposed house. A doubt as to the *modus operandi*, however, flitted across her mind, for she turned back as she was leaving the shop with the question—"Does Mr. — make them himself, and send them into the country?"

DANGEROUS STATE OF SALISBURY TOWER.

THE following is Sir Arthur Blomfield's report on the serious condition of Salisbury spire, or (to speak more correctly) of Salisbury tower, for, as will be seen by the report, the real failure is in the masonry of the tower; the spire, in itself, we believe, is in good condition, but the collapse of the tower would involve the ruin of the spire, the thrust of which is also partly the source of the danger. The report was communicated by the Dean of Salisbury to the *Times* of Saturday last, and has no doubt been seen by many of our readers, but it will be well to put it on record in our columns for future reference:—

"SALISBURY CATHEDRAL.

During the progress of certain minor repairs in the central tower it became evident that something was seriously amiss with the upper part of the two western stair turrets which required investigation.

A scaffold was accordingly erected round the north-west turret, from which a close and careful examination has been made, with the result that its state proves to be even worse than was feared.

A good deal of the external stonework is split and fractured and is in so loose and unsafe a condition that no assurance can be given of security from some serious disaster which might at any time occur. Certain cracks which are observable internally, especially one in the base of the spire at this angle, though they are certainly not altogether new, show indications of a slight recent movement which would inevitably become dangerously aggravated by any considerable fall of portions of the external stonework.

It is difficult to determine with certainty the precise cause of the present state of things in these turrets, but various adverse agencies have no doubt been gradually at work for many years past.

Of these the principal are, first, the numerous iron bands, rods, and ties which have been introduced from time to time, many of them in the most injudicious manner.

An attempt has been made to protect some of them with lead from wet and consequent corrosion, but this has in many places altogether failed and made matters worse rather than better. The next agents are wet and frost, which have gradually done much damage; and the third is to be found in the great thrust of the spire, which is continually active.

Nothing can be done to lessen or modify this last element of danger, but it is imperative to render the angle-turrets, which receive so much of it, as sound and strong as they can be made.

For this purpose any attempt at small repairs or patching would not only be useless, but positively dangerous. The work that is called for by the necessities of the case is emphatically not one of restoration, but of repair, which is absolutely essen-

tial for safety, and which to be effectual must be complete and thorough.

The greatest care, caution, and skill will be necessary in dealing with the damaged portions of both these turrets.

I should recommend the completion of the north-west turret first, to be followed immediately by the repair of the corresponding one on the south side.

It is impossible to give any accurate estimate of the cost of the work necessary to put these turrets in a sound and satisfactory state, but it will probably amount to about 5,000l.

ARTHUR W. BLOMFIELD, A.R.A.*

The subject is likely to be of so much interest to our readers, and the problem of dealing with the weak angles of a tower with such a great superincumbent weight on it is such an awkward one, that we have asked Sir Arthur Blomfield if he can give us any information as to the means it is proposed to adopt to put the tower in a state of security. He has replied in the following letter:—

"DEAR SIR,—Referring to your inquiries as to my report on the state of the western angle-turrets of the central tower and spire of Salisbury Cathedral, a point has not yet been reached when a detailed description of the *modus operandi* is possible.

The present scaffold was only erected to provide a means of closer examination than was possible in any other way at certain points, and it is quite sufficient for that purpose; but before anything more can be done, or the precise means of dealing with a difficult and complicated undertaking can be decided, this scaffold must be supplemented and made strong enough to receive such shoring, strutting, and needling as may be found necessary. This preliminary will be the first thing which will occupy my attention.

With regard to subsequent proceedings, all I can say with certainty at present is, that my endeavour will be to avoid the use of iron altogether.

Wherever I find it possible I hope to remove the bars and plates which have done so much mischief in the past, and in future to rely on bonders and bonding courses of stone, which, if properly used and well joggled and doweled are in every way much more satisfactory and reliable.

You will, of course, understand that I do not refer to the great iron ties and bands of the tower below, but to numerous small rods, bands, and plates which I believe to have been introduced in the upper part of the angle-turrets in the time of Bishop Sherlock, that is about one hundred and fifty years ago.—Faithfully yours,

ARTHUR W. BLOMFIELD."

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

III.—STANDED MOUNTFICHET.

ON Saturday last a party of fifteen members of the Architectural Association, including the President, Mr. W. D. Caröe, journeyed, under the leadership of Mr. A. W. Earle, to Standed Mountfichet, to inspect some of the works there carried out by Mr. Caröe. The heavy rain experienced had doubtless some effect on the numbers of the party, but owing to the kindness of the host, Sir James Blyth, Bart., covered carriages were provided, and met the visitors at Bishop's Stortford station. The first objective point was "Woodhouse," the residence of Sir James Blyth, and, after being refreshed by luncheon, the members inspected the additions made under Mr. Caröe, a part only of the clever design he has prepared, as well as the old house and subsequent additions. By taking advantage of the varied natural levels of the site, the architect has given the benefit of two virtual ground floors, the lower having the hall and dining-room for its principal features, and the upper providing the drawing-room, library, and billiard-room. One of the most striking features of Mr. Caröe's arrangement is the hanging partition which divides the dining-room when required, so as to form a cosy little room for a small family party. This partition is hung with counter balance weights, to which the addition of a small quantity of water gives a sufficient lifting power to raise the partition. When this water is run off the partition slowly descends.

The weather fortunately clearing somewhat in the afternoon, the party were able to proceed to the church, which has been entirely built from Mr. Caröe's designs, and the tower of which is now being completed. The church consists of chancel and chancel aisle, or chapel, nave and transept, a south aisle and western gallery. There

* See Mr. Philip Norman's "London Signs and Inscriptions." 1893.

re many interesting features in the design, possibly too many, as one feels somewhat worried by a little too much fidget. This is particularly noticeable in the tower, by reason largely of the sharp contrast between the red brick and Weldon stone, a contrast which the softening hand of time and weather will reduce. The detail is based on a late phase of Perpendicular, and hardly escapes the thinness which is often characteristic of modern work so based. The men of the fifteenth century left their work incomplete without colour, and a similar feeling seems to have inspired the architect of this building with the idea of using metal for the purpose. Bronze lions are thus dotted on the oak pulpit, and are some day, when a generous donor comes along, to be accompanied by bronze figures. So, too, the roof is intended to have oak angels under its trusses, and these angels have bronze, or rather green copper, wings. As a specimen and an incentive to the benevolent, the architect has presented the first and, up to the present, the only one of these angels. The colour-tone of the gun-metal lectern, made by Messrs. Singer, of Frome, from Mr. Caröe's design, is very pleasant. A happy effect is obtained in the internal stonework by the random use of Ketton, Causton, and Bath, the varied textures and tints of which go a long way to minimise the deficiencies of Perpendicular; indeed, the interior is far more satisfactory than the exterior, a result to which the treatment of the stonework just mentioned, and the quiet tone of the open oak roof, largely contribute. We have spoken of the detail as based on Perpendicular, but Mr. Caröe is evidently a long way from being a purist, either in detail or in ecclesiology, as the credence is on the north side of the chancel and the piscina on the south, in a hagioscope. We have illustrated his building in our issues for August 10 and November 23, 1889, June 28, 1890, and August 9, 1891.

From the church a return was made to "Woodhouse," where the carriages were in waiting to convey the party to "Blythwood Farm," the famous dairy-farm which contains some of the finest and best bred Jersey cows and bulls in England. These were duly inspected and admired, as well as the Shire horses and lamethdowns, but the buildings being adapted from old barns and other adjuncts of an arable farm were not to be regarded as models. In the middle of the show-yard, however, a pavilion has been erected from Mr. Caröe's designs, which furnished the architectural object of the visit to the farm. This is a simple but pleasing shelter for visitors on show-days, of white woodwork, large sheets of plate-glass, which it need hardly be said were not earnestly desired by the designer, and oak shingles with a red brick chimney through the apex of roof. A close earthenware stove with chimney mantel all round, forms the centre of the interior, and affords the architect a means of introducing some nice detail.

Returning to "Woodhouse," the stables were visited, which do not present features for remark, other than the use of white glazed bricks for lining, and the abandonment of the ordinary method of stable-door hanging in two heights, both of which afforded topics of discussion. The glass-houses were then visited as well as the engine and dynamo room which furnish the lighting of the house and other premises, as well as the motive power in the dairy. The dairy was the last thing visited, a charmingly-designed, luxuriously-fitted, example of dairy work. The dairy proper is below with two rooms, lined with Carrara marble, walls, ceiling and floors, and divided from each other by a plate-glass partition. An electric motor drives the separator and churn, and these were seen in operation. Above the dairy is a tea-room, luxuriously-fitted with oak joinery, India matting, incrusta, and with a balcony all round. Here tea was provided for the visitors, after which the carriages conveyed them to the station, concluding a very pleasant day's outing, in spite of the adverse weather.

MONUMENT TO HENRI MÜRGER.

We give an illustration, from a photograph, of the monument recently erected in the garden of the Luxembourg to the memory of Henri Mürger, mentioned in our last "Letter from Paris" (p. 5, ante). Mürger's principal work, the "Vie de Bohème," with its extraordinary and no doubt somewhat exaggerated sketch of the artist life of the Quartier Latin in old days, is well known to many English readers. The monument is the work of M. Bouillon, the sculptor also of the monument to Théophile Gautier at Tarbes.



Monument to Henri Mürger, in the Luxembourg Garden, Paris.—M. Bouillon, Sculptor.

ROYAL ARCHÆOLOGICAL INSTITUTE.

THIS Institute held its meeting this year at Scarborough as its headquarters, commencing proceedings on Tuesday, the 16th, when the Mayor received the visitors at the Court House in the Town Hall, and the Archbishop of York delivered his Presidential address, which did not deal with any special points in archaeological study, but was merely, as he himself characterised it, a few reflections as to the general importance and interest of the study of the relics of past ages. Not only the historian, he observed, but the architect, the artist, and the mechanic, as well as the naturalist, the philologist, and the numismatist might be laid under great obligation by the investigations and researches of such a society as this. Yet there was something quite apart from the emotional experience which they were trying to analyse, the impression received, and the interest felt in the remains of antiquity, quite apart from the collateral bearing upon special pursuits. When they tried to examine the sensations produced by the contemplation of what was old, they would find that they arose not so much from the thing itself as from ideas associated with it. If, instead of an abbey, a castle, or a lake dwelling, they were to come upon a crag or a boulder which closely

resembled these forms, they would certainly not be impressed in the same way. They might be interested in them from a mineralogical or geological point of view, but that interest would be of a very different kind from that experienced in the contemplation of an ancient ruin. The difference lay in this, that there were associations of ideas connected with one class of objects which did not exist in the other, and these associations belonged especially to the human element. As they looked at an ancient castle they thought of the great kings or nobles who dwelt in it centuries ago, with their households and retainers. They wondered what kind of lives they lived, what share they had in human joys and earthly sorrows. They imagined for themselves the deadly struggles which had taken place beneath the castle walls, or the great festivities which had been held within. They often said, "If these walls could speak what tales they could tell." It was not the mere ruin itself which stirred their feelings, however grand, or massive, or picturesque it might be. It was its human history which spoke to their hearts as they looked upon its silent walls.

In the afternoon a visit was paid to the parish church of St. Mary, which was described by the Bishop of Hull, who went into the subject of the

connexion of the church with the Cistercians. The party afterwards visited the castle, which was described by Mr. J. W. Walker, F.S.A., who pointed out the special character of the windows and fireplaces, in which herring-bone work is extensively used.

At the evening meeting, in the unavoidable absence of Sir George Sitwell, who was unable to read his promised paper on "History and State," owing to election engagements, a paper was read by Mr. F. Haverfield, F.S.A., on "Roman Yorkshire." In the course of the paper he said that it might be assumed that Yorkshire was occupied at some period before the time of Agricola. There was definite evidence of a technical kind that it had been actually occupied on or before 100 B.C. There was evidence that a certain regiment was in garrison in York, which was destroyed very soon after 100 B.C., and disappeared from history. The advance in Yorkshire was made from Lincoln, which was for a long time the foremost post of the Roman advance before they got to York. The Roman road proceeded first of all from London to Lincoln, and from Lincoln it took a sweep westward round the marshes of the Humber to York. The character of the Roman occupation of Yorkshire was rightly described as being a military occupation. In Silchester, Leicester, Canterbury, London civil life predominated, for there the Romans had set up their recognised form of municipal constitution. South of the Humber there were practically no troops, except at Chester and Caerlan, which were intended to dominate Wales; but it seemed as if the Northern part of Britain was made into one huge frontier to keep quiet the tribes in Scotland, and the tribes pouring into Scotland from Ireland. At York, however, there was a definite colony, with a full municipal constitution, but York with the neighbouring occupation at Aldborough must be regarded as merely towns in which the civil elements necessarily went with the military life found there. With the exceptions of York and Aldborough there were very few remains of Roman villas in the county. The other places of which traces were found were military forts, which were arranged along the roads. In dealing with the transformation of Roman Yorkshire under subsequent occupations, Mr. Haverfield said that after the Romans left the island the Roman element seemed to have lasted longer, mainly because of the hills, than it did elsewhere. The little kingdom of Elmet, near Leeds, seemed to have held its own against the Saxons down to the year 625, and when it was conquered it was conquered at a time when the ferocity of the Saxons had somewhat abated. In fact, speaking generally, the conquest of Britain by the Saxons was a much longer business than was generally supposed, and in the hills and dales of the north and west of Yorkshire the Britons had held out for a very long time. After Mr. Haverfield's paper, Mr. R. C. Hope read a paper on some of the most interesting features of Scarborough.

On the 17th the members visited Bridlington, where they met at the Priory Church, which was described by Mr. W. H. St. John Hope, who pointed out that the church was only a fragment of a much larger building, for the origin of which they must go back to Saxon times, when, as they learned from Doomsday Book, there was a church at Bridlington. About 1120 William de Gaunt founded in the Church of St. Mary of Bridlington, a Priory of Austin or black canons. The church was enlarged for their accommodation, and was afterwards rebuilt and became a divided church, the eastern part being practically a private chapel of the canons, and the nave, or western portion, continuing as the parish church. It so remained until the suppression in 1538, when all the eastern portion of the church—the presbytery, central tower and transeps, with all the monastic buildings—was pulled down, and only the parish part of the erection remained. Mr. Hope showed, by the aid of a plan based upon a survey of the buildings taken at the suppression, the extent and arrangement of the destroyed portion, and of the sites of the monastic buildings.

In the afternoon the members visited Burton Agnes Church and Hall, which were described by Mr. J. Bilson, of Hull. After the return to Scarborough, in the evening the Antiquarian Section was opened at the Royal Hotel, by Professor Boyd Dawkins, who dealt with the history of palaeolithic and neolithic man, as shown by the remains found in recent ages, pointing out how, from these remains, could be compiled the history of times before written records began.

On the 18th the members visited Whitby,

where the Rev. Canon Atkinson gave a discourse on the history of the site and building, observing that they might go back for at least 820 years to a period when architecturally superintended works were going on there and immediately adjacent. They were not to infer that there had been no sort of architectural work of that class in this close vicinity before the period he had mentioned; there had been more than one abbey church on that site at earlier periods. The old Saxon monastery had extended all around, though no doubt it was of very limited area to begin with. He considered that there were a few small cells in the old Saxon monastery, and probably a small abbey church. Afterwards they extended their borders. The cliffs must have receded at least 100 yards since the original monastic settlement was founded. The building of the abbey church commenced from about 1218 to 1220, and after going on for some time, he thought there was a pause in the progress of the work. Then a commencement took place for the completion of two transeps. There might be other reasons, but he conceived that want of funds was probably one of the reasons for the stoppage of the work in certain sections.

Mr. W. H. St. John Hope spoke at some length of the architectural features of the building. The company then repaired to the ancient parish church, erected towards the end of the eleventh century, and in the evening left by special train for Scarborough.

On the 19th the members visited St. Mary's, Beverley, where Mr. J. Bilson, F.S.A., read a paper giving a detailed history and description of the church, and after lunch the party met again at Beverley Minster, which was also described in a paper by Mr. Bilson. A tour of the building was afterwards made, and explanations given of the recently-discovered remains of the Chapter House on the north side of the chancel, and of the well near the altar, which it was supposed received the water from the piscina, and which was brought to light chiefly through the instrumentality of Dr. Stephenson. The tomb of an unknown ecclesiastic in the east aisle of the north transept was described by Mr. St. John Hope, and the musical instruments shown above the pillars of the arched nave, in the hands of stone figures, were explained by Mr. R. C. Hope.

At the evening meeting, at Scarborough, Mr. J. R. Mortimer read a paper on "The Pits on Allerston Moor," reviewing the various explanations which had been given of them, and drawing the conclusion that the correct explanation of them was, that they were unfinished entrenchments. Whilst he rejected in the main the village theory of these groups of pits, he did not entirely ignore the existence of the remains of pit-dwellings in Yorkshire, as, in several instances, he had discovered their undoubted remains in connexion with some British barrows which he had opened.

Dr. W. Stephenson then read a paper on Beverley in the old times, in the course of which he described how, between 1344 and 1366, work was carried out which, he believed, very materially altered the condition and appearance of the town, and immense amounts of "white stone" chalk were used in raising the streets to a higher level; probably to the level of the banks of the streams which ran through them; possibly higher, for some of the houses at any rate were built on made ground. All these streets except one still remained. This work no doubt put most of the Beverley water-courses except Walker Beck, which was open until some seventy years ago, entirely out of sight. In describing the mode of raising the streets, as revealed by the recent excavations, the lecturer said that some branches of hazel had been laid on the surface, having their length across the street. Upon these, and lying in the same direction, young trees were laid side by side, in some instances touching, in others 18 in. apart. Next came a layer of chalk, and occasionally pieces of building-stone in large closely-fitting blocks. These materials formed strata about 2 ft. thick, and the rest of the depth was filled with earth and loose stone. In concluding his paper Dr. Stephenson observed that nearly all the old streets in Beverley were called "gates," an Anglo-Saxon term which implied the early existence of the town.

In the Architectural Section Mr. J. Willis Clark read a paper on "Libraries."

On the 20th the annual business meeting was held, and subsequently Mr. Mickelthwaite read a paper on "A Cistercian Day," picturing the ordinary life of a Cistercian abbey, and Mr. Rye contributed another on "The Building Stones

and Canals of Rievaulx Abbey." The party in the afternoon visited the Priory Church of Old Malton, where Mr. St. John Hope described the buildings and their history.

On the 22nd the party visited Rievaulx, which was described by Mr. Mickelthwaite and Mr. St. John Hope; and in the evening, at Scarborough, Mr. Bilson read a paper on "Recent Discoveries at the East End of Durham Cathedral."

On the 23rd, the concluding day of the meeting, the members visited Pickering, where they inspected Lastingham Church and Pickering Castle. At the church Mr. Bilson gave a description, and explained its history by means of plans. The castle, an example of the round tower fortress, was described by Mr. St. John Hope, and the Rev. G. H. Lightfoot acted as guide at Pickering Church. The concluding meeting was held at the Royal Hotel at Scarborough in the evening.

[We think it right to say that we are indebted for most of the above particulars to the tolerably full and evidently careful reports in the *Yorkshire Herald*; a well-known archæologist who had undertaken the special report for this journal having unfortunately failed to send it in time for press. We have for so many years been specially represented at the annual meetings of the Archæological Institute that we should not wish it to be supposed that we had made any change in our intentions in that respect.]

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

The Chairman's Annual Review.—The Chairman, in accordance with the practice of his predecessors, read an interesting address on the work of the Council during the past year. In speaking of the improvement in the condition of the Thames, the Chairman said: "When the Council came into existence the river was more foul than at any time since the construction of the main drainage system nearly forty years ago. The pumping machinery at Abbey Mills and elsewhere was obsolete and dilapidated, and the low-level sewer was overcharged as far eastward as Somerset House. By compounding the engines at Abbey Mills and by repair of the pumps, we have accelerated the self-cleansing flow of the main drains, the low-level sewer is not over full, and has now always a steady flow in dry weather. We have cleansed the river by carrying away to sea 2,000,000 tons of sludge per annum, in six vessels, which have cost about 147,000*l.*, and the effluent passing into the river after the removal of the sludge is clearer than the river water, and can be made perfectly innocuous by passing it through filters of coke breeze. Our sludge vessels made over 2,000 passages last year at a total cost of about 40,000*l.*, or, to be precise, of 19*l.* 3*s.* 2*d.* per trip. There is no deposit on the sand in the Barrow Deep where the sludge is emptied. We spend 150,000*l.* a year in connexion with Barking and Crossness in this dealing with the sewage. There is a man now at Barking, Thomas Ellison, who at the time when the Council was established, and for twenty-eight years previously, earned an average of about 30*s.* a week by skinning with a net the sewer fat from the river surface and melting it down for commercial purposes. This fat, with other filth, amounting to 5,000 tons a year, is now intercepted by our screens and filth hoists, and is burnt or disposed of for agricultural manure. Our most interesting experiments have been in the filtration of sewage and in examining the atmosphere of sewers. A filter of one acre has been constructed, the material consisting of 3 ft. of coke breeze covered for retaining purposes with 3 in. of gravel. The quantity of effluent running through this filter is about 1,000,000 gallons daily, and the clarified result passing into the river has so improved that fish live for many weeks in it, and minnows and sticklebacks come up the ditch by which the filter is emptied to the very mouth of the outlet. If it were desired we could treat the whole of the metropolitan sewage in this way upon about 180 acres of land with perfect freedom from noxious smells in the operation, and then the effluent would be much less foul than the ordinary waters of the river."

Electric Light for the Victoria Embankment.—The Highways Committee recommended that they be authorised to take all the necessary measures for establishing, at a cost not exceeding 16,500*l.*, electric lighting for the Victoria Embankment and the Waterloo and Westminster

Bridges (but exclusive of the Embankment-gardens), and that for that purpose they be authorised to obtain tenders and to enter into contracts.

This recommendation was referred back, the Committee being instructed to report the cost of the present lighting, and to ascertain what would be the cost (1) of incandescent gas-lighting, (2) of electricity supplied by a company, and (3) of lighting the Embankment Gardens.

Proposed Cycle Track on Hackney Marsh.—The Parks Committee recommended the Council to approve in principle of the formation of a cycle track, and the erection of the necessary buildings in connexion therewith at Hackney Marsh, at a probable cost of 4,000l.

Mr. Jones moved, as an amendment, that the Council does not deem it expedient that any part of an open space acquired for the inhabitants of London should be set apart for the formation of a cycle track.

The amendment, having been seconded, was carried.

Lincoln's Inn Fields Improvement Works.—The same Committee also recommended an expenditure of 1,000l. for works of improvement at Lincoln's Inn Fields.

Several Councillors commented on the untidy and neglected condition of the Fields, and Mr. John Burns, in the course of some remarks, suggested that tar-paving should take the place of the present gravel paths.

Mr. Fletcher, the Chairman of the Committee, said that the Committee had done very little to this open space, because they wanted to see its requirements.

The report of the Committee was adopted.

The Supply of Water in the East-end.—The Water Committee, in their report, stated that the Engineer had reported that it had come to his knowledge that in several parts of the Metropolis, both on the north and south of the river, districts which had been placed under constant water-supply had been brought under the system of intermittent supply, and that without any notice having been given. The East London Company was again a defaulter this year, and they (the committee) had received from the Fire Brigade Committee a copy of a letter addressed by the engineer of the company to the District Superintendent of the Fire Brigade, intimating that the company proposed, on account of the drought and waste of water, to shut off the supply during part of the night from some of its service pipes. The discrepancy between the position taken up by the company before the Royal Commission and that now assumed by it with regard to constant supply was worthy of attention, and they directed special attention to the fact that although the company was authorised to draw 10,000,000 gallons daily from the Thames, it only took during the month of April (the last available return) 3,213,547 gallons, while at same time it was drawing 16,700,000 gallons a day more from the River Lea than by the company's statement it acknowledged it could. It should also be noticed that in April last the New River and the East London Companies drew collectively from the River Lea 67½ million gallons per day, notwithstanding the fact that the Duke of Richmond's commission in 1869 stated that from that source not more than 50 million gallons could be expected, and that the recent report of the commission of Lord Balfour of Burleigh expressed the opinion that the present drawing on the River Lea was too great, but that by the construction of proper storage reservoirs, 52½ millions a day could be abstracted. They had instanced the case of the East London Company because it had been previously before the Council, and because they were in possession of positive information with regard to it, showing that there was a breakdown of the supply last autumn, and again during the frost of last winter, and that at the present time large areas of its districts were restricted to a supply of only two or three hours a day; but the remarks applied in a greater or less degree to other companies. They recommended:—

"That a letter be addressed to the East London Waterworks Company, pointing out the above-mentioned facts and the figures stated before the Royal Commission, and asking whether the Company will give the Council the following information, viz.:—(a) How much water the Company has drawn from the Lea during the past week; (b) How much it has drawn from wells during the past week; (c) How much it has drawn from the Thames during the past week; (d) How much it has drawn from the gravel springs at Hanworth during the past week; (e) If the company is not drawing ten million gallons a day which it is authorised to take

from the Thames, what are the reasons why this has not been done."

Mr. Beachcroft moved to add to the recommendation the following questions:—

"What is the extent of the storage works being undertaken by the Company under their Act of 1894? What is the progress being made with those works, and what would the progress now have been if the Company's Bill of 1892 had been passed in 1893 instead of being thrown over another Session?"

Mr. H. P. Harris seconded the amendment.

Mr. Marks gave notice to move "That meanwhile the Council's Engineer do confer with the East London Waterworks Company as to the best means of improving immediately the now insufficient and irregular supply.

Mr. Goodman said he understood that while this company were starving their poorer customers of water, they were selling millions of gallons to rich manufacturers and to local authorities for watering the roads.

After further discussion the addition proposed by Mr. Beachcroft was rejected, and Mr. Marks' amendment, having been accepted by Mr. Idris, on behalf of the Committee, was agreed to.

Mr. Charles Harrison, M.P., moved a further addition: "That such application be without prejudice to the Council's rights to enforce its claims against the company."

Dr. Collins seconded this amendment, which was also agreed to, and the Committee's recommendation as amended was adopted.

The Council adjourned soon after seven o'clock.

COMPETITIONS.

WEST OF ENGLAND EYE INFIRMARY.—Out of thirty sketch designs sent in in the preliminary competitions five were selected by the assessor to be worked out in the final competition. Of these five designs the assessor advised the committee that he considered that sent in under the motto "Exe" to be the best, and the committee having carefully examined the plans, have unanimously confirmed his choice. The authors of the design marked "Exe" are Messrs. Edward Thomas & Sons, of 7, Queen Anne's Gate, Westminster. The other four designs were placed by the assessor in the following order of merit, and this was also confirmed by the committee:—"Health"—Mr. Ernest Herbert, of 32, Southampton row, London; "Alia"—Messrs. Shoebridge & Lewis, of 103, Strand, London; "Outpatient"—Mr. W. F. Edwards, of 184, Lazell-street, Birmingham; "In Oculus"—Mr. H. F. Talbot, of 7, Cherry-street, Birmingham. It is understood that a portion only of the complete building will, in the first instance, be undertaken, and the choice is made subject to a reliable tender being obtained for the work within 10 per cent. of the architect's estimates, this having been made a condition in the instructions issued to the competitors. The assessor was Mr. Charles Barry.

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual excursion of this Society was held on the 20th inst. at Chesters, the residence of Mr. N. G. Clayton. Twenty-one gentlemen from Newcastle, Sunderland, South Shields, &c., were present. Mr. Robert Blair, F.S.A., conducted the members over the remains of the Roman station of Clunnum, and explained the camp, &c., to the members. Mr. Rich, Vice-President, conducted the party over the new buildings, and explained that Chesters has been in possession of the Clayton family for about ninety years. It was originally built by the Erringtons. Some additions were made to it, chiefly in a portico on the north side in Mr. Dobson's time. The present owner, Mr. N. G. Clayton, has had extensive alterations made. The old mansion house has been really gutted and nearly rebuilt, and forms a very small portion of the mansion of to-day. It is built of stone throughout from the neighbouring quarries, is lighted by electric light, generated by Mr. Clayton's own installation, and is supplied with water from a spring about three miles away. Chesters is a great store-house for Roman antiquities, standing as it does on one of the Roman stations, and a great number of objects of antiquity are cared for. Before the present additions, these were partially stored in one of the rooms of the house, partly in the portico, and other places. Mr. Clayton, however, has now built a museum near the entrance lodge, in which to store all the objects of antiquity. New stables have been built a short distance from the house. A new carriage drive is also being made, with entrance

lodge and gates. The contractors for the work have been Mr. Walter Scott, of Newcastle; Messrs. Middlemiss Bros. for builders and joiners' work; Mr. Civil, of Hexham, for part joiners' work; Messrs. Watson & Sons, Newcastle, for plumbers' work and heating; Mr. Smith, of Hexham, for part plumbers' work; Mr. Baty, of North Tyne, and Mr. Charlton, of Stamfordham, for tiling and slating; Messrs. Wilkinson & Co., for plasterers' work; Mr. Ellis, of Hexham, for painting and glazing; and Messrs. Mungrave & Co., for stable fittings. The mansion has been carried out from the designs of Mr. Norman Shaw, and the rest of the works in museum, entrance lodge, gates, stables, houses for coachman, gardener, &c., from designs by Mr. Frank W. Rich, of Newcastle-on-Tyne. After dining together at the "George Inn," at Chollerford, the party returned to Newcastle.

Illustrations.

FRIEZE-PANEL: "HERMES PSYCHAGOGOS."

THE illustration of this design is from a large distemper drawing 7 ft. 4 in. by 4 ft. 4 in., by Mr. J. Staines Babb. The title indicates the function of Hermes as the leader of souls (*ψυχαγωγός*) to the next world, and illustrates the peaceful arrival of a group of youthful dead in the underworld.

The legend, "Whom the gods love die young," written in Greek on the background of the design, is attributed to Meander the poet, who was a contemporary of the first Ptolemy. A Græco-Egyptian treatment of the accessory ornament has been intentionally pursued in this design.

WEST HAMPTSEAD CONGREGATIONAL CHURCH.

THIS church, which has been built at the corner of Finchley and Burrard-roads, adjoins Hackney College.

The plan of the church is that of the "central area" type of church building, and is one that best suits this site. The architects consider that this system of plan not only keeps the congregation well within range of the preacher's voice, but also permits of the side and end galleries being constructed without having recourse to the usually objectionable columns of iron or stone, which, besides being detrimental to seeing and hearing, tend to lessen the impressiveness of the internal effect of the building in which they are placed.

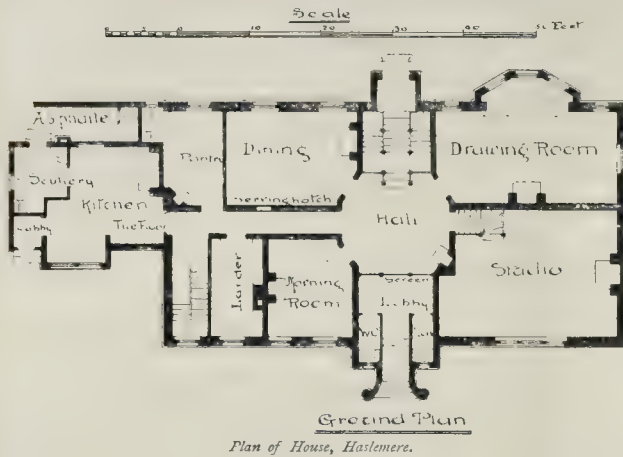
Accommodation is provided for 850 worshippers. Ample means of ingress and egress have been provided by five doorways on the ground floor, and spacious lobbies are placed at the entrances. The floor of the church is formed of solid wood blocks laid on cement concrete. The style of architecture adopted is Gothic, and the whole of the external walls are faced with red bricks, and the ornamental dressings are of terra-cotta and of moulded bricks. The roof is supported with hammer-beam principals, which are exposed to view, the spaces between being plastered.

Great attention has been paid to the ventilation of the church, and there are seven "exhausts" to take the vitiated air out of the building; and ample fresh-air inlets have also been provided.

The internal faces of all walls are plastered. The windows are filled in with stained glass. The roof is boarded, felted, and covered with green slates. The pews, gallery front, roof principals, and all internal woodwork are made of pitch-pine. A perspective view of these buildings appeared in the Royal Academy Exhibition last year. The school department contains a spacious hall, with a nave and two aisles, and the aisles are so arranged that six class-rooms can be formed on each side of the hall. This can be done by sliding divisions, and when these are thrown back the scholars in the class-rooms can all see the speaker on the platform. The school hall affords accommodation for about 500 persons, whilst the infants' class-rooms seat about 100 children.

A library, a large class-room and kitchen complete the school department, but the two vestries provided for the church, and also the spacious church parlour, are equally available for use in connexion with the schools. Accommodation is also provided for a caretaker, and a living-room, scullery, and two bedrooms, are included in this scheme.

At the present time the church alone is built, and the contract for this and the two vestries, the



boundary walls, &c., has been carried out by Mr. T. H. Kingerlee, of Oxford, at the cost of about \$,000.

Messrs. Spalding & Cross are the architects for the building, under whose supervision the work has been carried out, and Mr. W. H. Gathercole has acted as clerk of the works. The church was opened last week.

STAFFORDSHIRE GENERAL INFIRMARY.

THIS hospital is built in the town of Stafford, on one of the main roads, and, though substantially built, was ill-arranged. The accommodation was for seventy-five patients, but the wards were arranged side by side, so that cross ventilation was impossible, and it was therefore decided to pull down and entirely rebuild the whole of the accommodation for patients, and remodel the centre block for administration purposes and accommodation for the nurses and sisters.

The highest portion of the site is along the main road, and it, therefore, became necessary to extend the wards along this frontage and settle the general disposition of the ward blocks. All the wards, with the exception of the children's ward (which is north and south), have an east and west aspect, and are all aërially disconnected from the central block. Each of the large wards has the usual ward kitchen at one end, and bath, lavatory, water-closets, and sink-room at the other, with a separate escape staircase at the end. The wards are 24 ft. wide, and the beds are spaced 8 ft. centre to centre, the clear height of the wards being 13 ft.

The floors are laid with narrow-tongued oak boards with fireproof floors, the walls are finished in parian and painted, and all angles are rounded off. Each large ward is heated with two stoves with descending flues, and hot-water radiators combined, through which the fresh air is warmed and admitted to the wards; the extract is by means of vertical flues in the walls, assisted, when necessary, by Kite's ventilators. The wards are built on arches, so that they have fresh air circulating round them, both vertically and horizontally.

In the basement, which is entirely above the ground at the rear, and opens on to a garden, are the out-patients' department, with consultation and examination rooms and dispensary, kitchen and offices, doctors', nurses', and servants' dining-rooms, &c., also the existing lundry in detached building.

On the ground floor are two large wards and children's ward for ten beds, three isolation wards, one for children, a day-room, operation and preparing rooms.

In the centre block are casualty and examination rooms, house and assistant surgeons' bed and sitting rooms, matron's sitting-room, and Board-room.

On the first floor are two large wards, two bed-wards, isolation-ward, and day-room.

In the centre block are sisters' and nurses' bed and sitting rooms, and matron's bed-room, and the usual conveniences.

On the second floor are servants' bed-rooms, splint and linen rooms, and the usual conveniences.

The walls are 18 in. brickwork throughout, finished externally with rough-cast and brick-dressings, which treatment has enabled the centre block to be made to correspond with the new work; the roofs are covered with Westmoreland slate.

The Children's Ward is the especial gift of a lady.

The north block of wards was first erected, Mr. T. Espley, of Stafford, being the builder, Mr. Peabworth acting as clerk of works. The remainder of the work is now in hand, the builder being Mr. J. Gethin, of Shrewsbury, and Mr. G. Poole the clerk of works.

The heating and hot-water arrangements throughout are by Messrs. Clements, Jeakes, & Co., and the sanitary plumbing by Messrs. Dent & Hellyer.

The architect is Mr. Aston Webb, and the drawing is exhibited in the Architectural Room at the Royal Academy.

RESIDENCE, HASLEMERE.

THE residence at Haslemere, which we illustrate, is from the design of Mr. George A. Hall, of Westminster. The design is based on the style of the Christopher Wren school, and with the exception of the wing forming the domestic part, the house is rectangular. The lower part is red brick, and the upper story of rough-cast. A bold oak string-moulding divides the stories and all the eills and beads to the windows are of oak. The high-pitched roof, starting from an egg-and-tongue moulded cornice, with brackets to carry the eaves, terminates with a parapet, below which is sunk a flat roof with a large lantern lighting the billiard-room, and a domical skylight throwing light down an octagonal well to the main hall.

The entrance is in the centre, protected with a moulded oak canopy, suspended with wrought-iron ornamental rods. A vestibule screen shuts the hall off, and on entering a winding double staircase to the first landing presents a prominent feature. The high oak newels and balusters are in keeping with the general character. The hall is decorated with weapons collected from different parts of the world, and a recumbent marble statue in the centre is effectively lighted by the top light before mentioned. Descending from the hall is the studio, an apartment about 25 ft. long by 18 ft. wide and 16 ft. high, lighted by a large north light. Adjoining this is the drawing-room, with a bay window which overlooks the country round and the valley of Blackdown.

A panellled dining-room with a contiguous morning-room completes the reception portion of the house. A corridor leads to the back stairs and domestic quarters, which are placed on the east side. Ascending to the first floor, with corridors running east and west, are the bedrooms, and again mounting to the roof, is the billiard-room and servants' bedrooms. The house contains briefly nineteen rooms, besides bath-room, cellars, and other offices. The whole is lighted throughout by electricity, installed by Messrs. Pyke, Harris, & Co., of Westminster, and worked from accumulators charged from a dynamo driven by an oil-engine, which does double duty by

pumping water from a deep well. The house and stables stand in about six acres of land, well wooded with larch, hazel, and oak; and the house commands views through the opening vistas of the surrounding country for many miles.

Special care has been given to the internal decoration. All the fireplaces are fitted with Teale's grates. The mantelpieces are specially made. Externally the colouring has been kept low in tone, the orange red of the brick harmonising with the quiet grey of the rough-cast, and the subdued green, of the darkest neutral colour, with which windows and frames are painted.

HOUSE IN HARLEY-STREET.

THIS house has recently been built on the site of the old "Turk's Head" public-house. Utility and convenience have been the first considerations in the planning and construction. The rooms are arranged to obtain the maximum amount of sunlight, and to be away from the party-wall, so as to avoid, as far as possible, the objections inseparable from attached houses. A hydraulic lift is fitted to run from top to bottom. All the joinery on the three principal floors is of mahogany and oak, except some of the linings and skirtings, which are American whitewood. The floors are teak, and the main staircase is oak, made up from the staircase which was formerly in old Ranelagh House. The exterior is faced with red Farnham bricks, with red Mansfield stone dressings. All the windows have wrought-iron casements. The building was erected by the owner, Mr. Bruce Clarke, assisted by a clerk of the works, without the intervention of a contractor. The architect is Mr. F. M. Elgood, of London.

Books.

American Electric Street Railways, their Construction and Equipment. By KILLINGWORTH HEDGES, M.Inst.C.E., &c. London: E. & F. N. Spon. 1894.

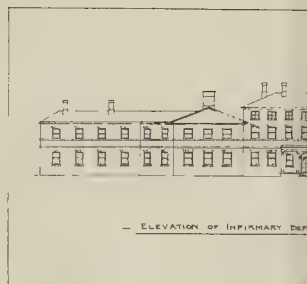
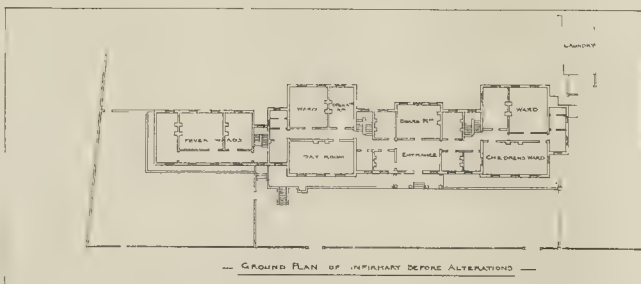
THE marvellous growth of the electric tramway industry in America is not sufficiently appreciated in this country. While we have done, comparatively speaking, next to nothing during the last five years in electric traction, in that time six hundred electric tramways have come into existence in America, operating nearly 10,000 miles of track and over 20,000 cars. The capital invested in American electric tramways is 45,000,000., held not only by interested railway companies, as the Pennsylvania Railway Company, but also by companies seeking permanent investments for their capital, as the New York and Boston insurance societies. The West End Street Railway Company, Boston, which is the largest tramway company in the world, pays 9 per cent. on its ordinary shares and yet you can travel 7½ miles for 2½d. in a comfortable car. America is the country which has the most to teach us about electric traction, and any book on this subject can hardly fail to be interesting.

This handsome volume is the result of an extended tour by Mr. Killingworth Hedges in America. It can be readily understood that with such a wealth of material to compile from, the author must have had considerable difficulty in selecting typical systems to describe. We were disappointed, for example, in finding nothing about the Philadelphia Traction Company, with their underground system of feeders, and their electric street-sprinkler that runs at fifteen miles an hour, sprinkling the streets to allay the dust.

In the preface there is a good deal that calls for comment, and not least the following statement:—"In the following pages American practice is exclusively treated." After reading this one is somewhat taken aback by reading a full description of the Buda Pesth tramways, as well as English electric tramways. The introductory chapters on the electrical circuit, on historical notes, and on the construction of the road, are accurate and clearly illustrated. The descriptions, too, of the trolley and conduit systems are good. The author is not sanguine enough about "multiphase" currents, unless he means by the "distant future," a year or two.

The chapter on electric motors opens with a feeble description of the three-wire system as used at Portland, Oregon. The first diagram is misleading, and would hopelessly fog the general reader. Alternating currents for traction are dismissed in a short paragraph, a foot-note referring to the Siemens three-phase motor at the Chicago Exhibition. The rest of the chapter





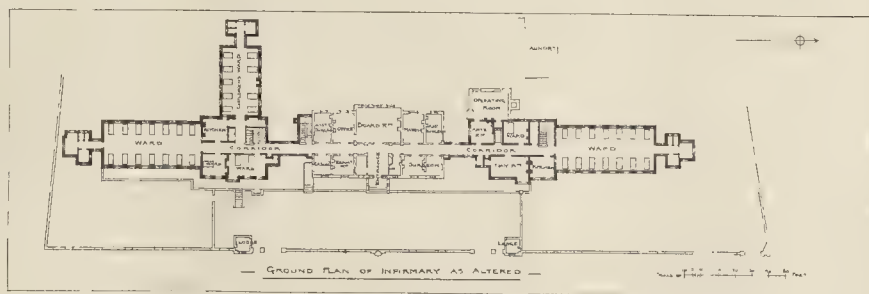
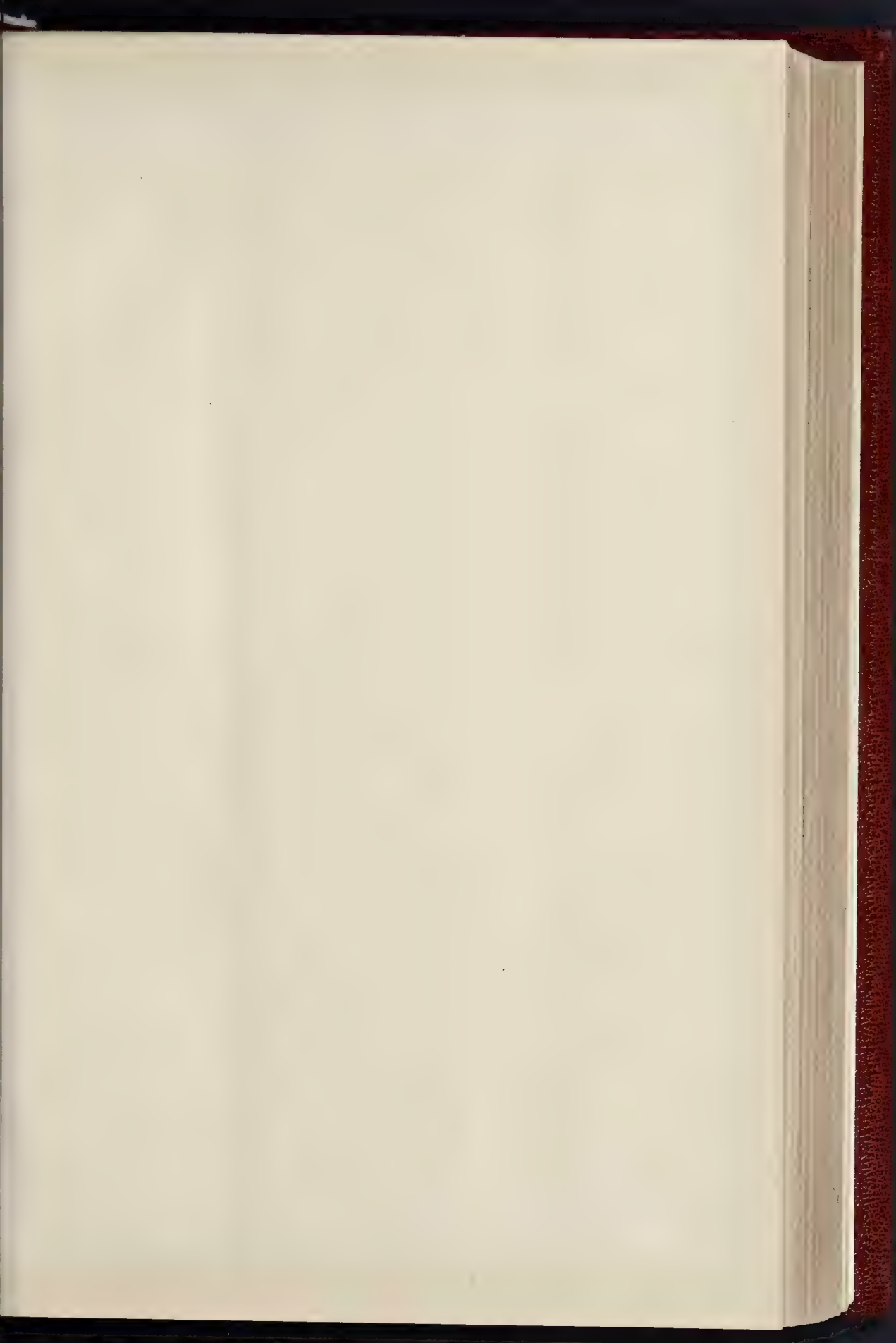


PHOTO BY SPRINGUE & F. A. W. EAST HADLEY STREET, LITTLE ROCK, ARK.





CONGREGATIONAL CHURCH, WEST HARTFORD, CONNECTICUT





THE BUILDER, JULY 27, 1895.



By the Author of
"The Builder's Life"

RESIDENCE AT HASLEMERE, SURREY.—MR. G. A. HALL, A.R.B.A., ARCHITECT.

№ 51 HARLEY STREET W
FOR W. BRUCE CLARKE ESQ^{RE}



GROUND-PLAN



gives well-illustrated descriptions of motors made by the General Electric Co., the Westinghouse Co., &c.

A fuller description of the use of the "Booster" dynamo would have been welcome; we expected to read something about how it got rid of the necessity of having such heavy copper mains. The description of lightning-protectors is a little too short to be quite intelligible. The necessity for these on tramway lines is not quite appreciated by engineers in this country, but the following extract, describing Mr. Sprague's experience on the pioneer Richmond line in 1887, illustrates the need of them:—

"Passengers often did not know when the lightning discharged through the car circuits, or if they did, they quickly got used to it. We found that the lamp circuits offered a very free path, so when a thunderstorm appeared the lamps were turned on, ostensibly to light the car, as was carefully explained to timid lady passengers, but really to give the lightning a free path."

Chapter XI., on examples of electric railways, gives brief, but clear, descriptions of the West End Street Railway, Boston, and of the Niagara Falls and River Railroad amongst others. Chapter XIII. is a compilation from various sources comparing the cost of traction by cable, electricity, and animal power.

In an appendix a glossary of technical terms is given, which explains many Americanisms found in the work. Mr. Hedges might with advantage have given us the English equivalents in the text, as circuit-breaker and current-diverter are not nearly such good names as switch and resistance. The explanation given of "Booster" is obscure, "a current of varying potential," being apt to upset one's ideas; also to explain a "burn-out," as "destruction, usually caused by a short circuit," is like defining a "broken oar" as "waste, generally caused by catching a crab."

The book is very handsomely got up, and there are plenty of good pictures and diagrams, which make it very inviting. Every tramway engineer will find it useful. As a book of reference it is valuable, and, treating as it does of an industry which is just beginning to be developed in this country, it can be recommended to youthful electrical engineers.

Electrical Engineering for Electric Light Artisans and Students. By W. SLINGO and A. BROOKER. New and revised edition. London: Longmans, Green, & Co. 1895.

In the preface to the first edition the authors state that their endeavour is to provide a single work covering the whole field of electric lighting, which would not only be useful for junior electrical students, but also for those who, having little or no electrical knowledge, yet have under their supervision various kinds of electrical machinery. Hence the work would be of service to marine, railway, and tramway engineers, municipal officials, and managers of mines and factories.

The authors may be congratulated on having succeeded to a very considerable extent in their endeavour. Many difficult matters are explained in clear and simple language, and mathematical symbols are used most sparingly. Perhaps the book would have been made more useful by important formulae being given in foot-notes or in an appendix, but after all, if the student knows enough to be able to use the formulae intelligently he could easily supplement the lucid descriptions in this book by reference to mathematical text-books. Already the book is getting of unwieldy size, and there is not much room for pruning down, whilst many new developments are barely touched upon.

The first three chapters treat of units, Ohm's law, and primary batteries. The description of the Clark Cell is the only one we take exception to, being a little antiquated. The platinum wire fused through the test-tube is found not to answer in practice. Why drag in any reference to the B.A. unit of pressure? This might well puzzle an electrician, let alone the municipal official. Although it is mentioned that the E.M.F. of the Clark Cell decreases with increase of temperature, yet its E.M.F. is given as 1.435 volts without specifying the temperature. We have tried to verify the statement that "all liquids do not diffuse at a uniform rate, the rate of diffusion varying inversely as the square of their specific gravities," but have not found any authority who would commit himself to such a sweeping assertion. Indeed, alcohol and water behave in quite a different manner, as the heavier liquid diffuses more quickly than the lighter one.

Chapter IV. is on the measurement of current strength, and explains clearly various types of ammeters. In describing the Siemens' dynamo

meter, it is not stated that the movable coil should be placed so that its plane lies east and west, with the side in which the current is descending pointing towards the east. If this is not done, two different readings are got, depending on the direction of the current through the instrument.

In rough work we may often neglect this precaution, but whenever making a test pretending to accuracy we must place the dynamometer in the position described. It should also have been stated that it cannot be used in the neighbourhood of a dynamo or a choking coil, *i.e.*, in an irregular or varying magnetic field.

The next chapter is on the measurement of resistance, and gives all the ordinary methods. Sufficient stress is not laid on the importance of recording the temperature of the coil when giving its resistance. Nothing annoys an electrician more than when an apprentice gives an elaborate list of resistance measurements without any mention of temperature. The method which is given for measuring the resistance of a galvanometer is a very bad one. An error of 5 per cent. in reading the current—quite a possible one when using a tangent galvanometer—would produce an error of nearly 300 per cent. in the result deduced (p. 149). This surely should have been pointed out. Perhaps the authors thought that if they did this, the shock to the reader would make him chary of their methods in the future. The telephone method of measuring resistance might have been given with advantage. It would have been better if keys were always shown in the diagrams, as beginners are only too apt to omit them. In describing the method of using the Silvertown Testing Set in order to measure insulation resistance, it is assumed, as is commonly done, that the deflection of the galvanometer is proportional to the current. This assumption is only approximately true for small deflections, and we have seen strange results arrived at by assuming that it holds true for large deflections.

Chapter VII. on electro-magnets and electromagnetic induction is an excellent one, and gives a clear idea of a difficult subject. The chapters on dynamo-electric machines proceed on the usual lines; we could dispense with the description of the De Meritens machine, and would like to have had an inductor alternator described, as these are puzzling to the uninitiated. The descriptions of motors and their applications, transformers, secondary batteries, &c., are as good as the limited space at the disposal of the authors allows. The chapter on photometry is fair; the relative advantages of Rumford's and Bunsen's methods are not discussed, and the reader might think that a Bunsen photometer could be used in a light room. The last few pages in the book, describing meters, are unsatisfactory, only a few old-fashioned forms being shown. We were surprised at finding no description of a watt-meter, or a condenser, in the book.

Notwithstanding the one or two faults we have pointed out, we can congratulate the authors on having produced a thoroughly serviceable text-book. Their style is clear and lucid throughout; there is an excellent index, and for a book of this size there are remarkably few misprints.

Portable Electricity. By J. T. NIBLETT. London: Biggs & Co.

MR. NIBLETT has written this treatise mainly for the use of those who use small secondary batteries for economic, artistic, or scientific purposes. A great many people possess small secondary batteries, and, owing to ignorance, they are often ruined by neglect or improper methods of charging. Part III. of this little book on the management of portable apparatus for storing electrical energy will prove very useful to them. Part I. describes nearly all the possible uses that small electric batteries can be put to. The description of their use for decorative and stage effects may prove useful to those getting up Christmas theatricals.

Correspondence.

To the Editor of THE BUILDER.

ARCHITECTURE AND THE ACADEMY.

SIR,—I have hesitated to express an opinion on this matter from a feeling that I have been somewhat "out of it." But your admirable summing-up of the discussion which you so effectually raised induces me now to say a few words from my own isolated position and independent point of view respecting it. I never had any efficient instruction in finished drawing, or any effectual style of drawing at all to follow. Getting into active work at the earliest possible age, I never acquired it. With all my deep

appreciation and patient study of old work, I could only endeavour to impress it on my mind by sketching and drawing, but without the power of reproducing it in an appreciative or attractive form to others. I remember a leading man in the west country of that day saying I was the only architect he knew whose executed work was so greatly superior to what appeared to be expressed by his plans; which, though cutting sharply both ways, I naturally took as a great compliment. And I remember my friend Mr. Street saying of me—almost at me—that, necessary as drawing was to an architect, he knew there were real architects who could not draw.

Still, having made my way, and with an office-staff of eight or ten, and with most of the drawings sent out necessarily made by assistants, I have never sent out anything that was not essentially and absolutely my own, whether good or bad, even to the smallest detail. I used to design a great deal to $\frac{1}{2}$ -in. scale, to be reduced subsequently to $\frac{1}{4}$ -in. My modes involved also the necessity for a considerable amount of personal instruction and direction to smiths, carvers, and other handicraftsmen. Yet I have never acquired the art of sending in more than one or two designs acceptable to the Academy, whether drawn by myself or by others; although I have seen there very many showy sketches of buildings void—as it seemed to me—of all architectural merit or character.

Though "I say it as should be,"—like the farmer who had "the best pair of leathern breeches in our parish,"—I am convinced, for instance, that my important work of "Humewood" ought to have been exhibited, as illustrating architectural progress (or retrogression), even though neither the large nor the small perspective might be said to come within the category of high academic finish. Or, again, I would submit, in like manner, the perspective of the design for the Infirmary Hospital for Winchester College (either the smaller one, or the larger one with plan in the corner), to which was awarded, by the National Health Exhibition, the silver medal (the highest award) for school sanatoria.

Perhaps you will not be surprised, therefore, if I should endeavour to go a little beyond all the suggestions which have been made—as to "more space," "better classification," exclusion of "sketches of old work" (which are better fitted for a water-colour department), separation of stained glass and decoration, more efficient discrimination in selection, &c.

We are credibly informed that one architect is deputed to look after the interests of the architectural branch of the annual exhibition of the Academy! But is this all that is due either to the Academy itself or from a Royal Academy of the Arts of Painting, Architecture, and Sculpture? No, assuredly; for architecture is entitled to due recognition equally with the other arts, and only the architectural members of the Academy should be on the Hanging Committees for architectural works, to the exclusion of painters. Their number should be recruited up to some given number by architects chosen from the Institute, whether selected by the President or invited by the Academy, as might be arranged.

The selection of the paintings is thrown, and properly thrown, upon a committee of expert painters, exceptionally fitted for the task, which task, if performed with any amount of discrimination and sense of responsibility, must be well-nigh overwhelming. And it would be most unreasonable to expect them, at the end of their own special work, to expend their exhausted energies in pronouncing a discriminate judgment upon any number of the works of another art, a task for which they are eminently unfitted, yet which they would hesitate to delegate to any "inferior" department or authority.

Reform must come if ever architecture is to be expected to hold her own; and it must proceed upon some such line as that which I have ventured to indicate.

WILLIAM WHITE.

The Student's Column.

METALS USED IN BUILDING.—IV.

THE PRINCIPAL ORES (continued).

LEAD.—Whether this metal occurs in the native state, or not, is a doubtful point. Pure lead, according to certain authors, has been found in thin plates or scales, and in small globules. It is said to have been met with at Alston Moor, in Cumberland, in the Carboniferous Limestone of Bristol, at Kenmare in Ireland, and other places; its method of association with the ores of lead has suggested the probability of its having been accidentally reduced. Be that as it may, pure lead, if it exists, is a mineral of extremely rare occurrence.

The principal ores of lead are:—

1. *Galena*, or sulphide of lead (lead and sulphur), which contains about 86.6 per cent. of the metal.
2. *Cerussite*, white lead ore, or carbonate (lead, oxygen, and carbonic acid), with about 77 per cent.
3. *Anglesite*, lead vitriol, or sulphate (lead, oxygen, and sulphuric acid).

4. *Minium*, or red oxide of lead (lead and oxygen).

5. *Pyromorphite*, or green lead ore, a phosphate of lead, with a number of varieties.

The above enumerated ores are by no means the only ones raised, but no others are important for our purpose. Indeed, we felt almost inclined to omit the three last-mentioned also, as the lead of commerce is almost entirely obtained from the sulphide and the carbonate, principally the former. No mineral is more readily recognised than galena, and when most people speak of lead they mean that variety of it. It crystallises in the cubic system, and the cleavage is perfect, a lump breaking up into minute cubes of bright steel-grey lustre when struck by the hammer, or when any force is exerted on it. Some galena is bluish-metallic in appearance. The difference in lustre and colour is due in many instances to the admixture of other substances with the true galena. One of the commonest foreigners is silver, and when present in any quantity the ore is known as *argentiferous galena*. As it is not difficult to separate silver from lead, the ores of the last-mentioned metal are as much exploited for the silver as for their own sake, and other valuable substances are found therewith. Galena occurs massive, and coarsely or finely granular. According to recent Parliamentary returns lead ore comes from no less than twenty-one counties in the United Kingdom; also from the Isle of Man. Durham produces most, and Derbyshire and Flintshire yield large quantities; but the most productive mine is Foxdale, in the Isle of Man. The amount of lead obtainable in smelting is reckoned as 95 per cent. of the amount indicated by dry assay. In calculating the quantity of silver obtainable from the ore, the amount in ores containing less than 3 ozs. silver per ton is generally omitted, as in the majority of cases it is not extracted. Lead is a mineral of almost universal occurrence; large quantities come from Spain, Australia, and the United States.

Of the minor varieties of ore the carbonate is often found with galena, and when pure it is a white crystalline mineral, possessing, sometimes, an earthy appearance, though it occasionally assumes a dark bluish tint when a slight proportion of the sulphide is mixed with it. When regularly crystallised it is rhombic in form, but it also occurs granular, massive, compact, and stalactitic. Mr. F. Rutley remarks that it may result directly from the decomposition of the sulphate (anglesite) by water charged with bicarbonates. As anglesite results from the oxidation of galena, by the sulphide being turned into sulphate, the carbonate (cerussite) may therefore be regarded as being indirectly derived from the decomposition of galena.

In order to avoid misconception, although we shall revert more in detail to the subject later on, it may be stated that the "white lead" of commerce, when it has any right to the name, and is carbonate of lead, is not always derived from cerussite as the latter occurs in nature. In fact, "white lead," as used for white paint, &c., is for the most part, artificially prepared; one method of obtaining it is by passing carbonic acid gas through a solution of subacetate of lead; another is by acting upon sheet-lead by acid fumes. Such white lead, though free from adulteration, is not as good for paint as when mixed with barytes (sulphate of baryta), as it is apt to become blackened in time, owing to the carbonate being transformed into sulphide of lead.

Minium, the red oxide, is usually found associated with galena, and sometimes with cerussite. It occurs in parts of Shropshire and Yorkshire, at Alston in Cumberland, Weardale in Durham, at two or three localities in Scotland and Ireland, and sparingly in Germany, Siberia, and the United States. The red lead of commerce, used in the manufacture of flint-glass and for various purposes by the plumber and painter, has the same chemical composition as minium, but is prepared artificially. The sulphate (anglesite) is represented in many localities, and occurs in sufficient abundance to be worked as an ore in certain parts of the world, notably in Australia. Pyromorphite is found associated with other ores of lead at various localities, and when plentiful is smelted. It is composed of phosphate and chloride of lead, occasionally of phosphate of lime and arsenic acid.

In regard to the mode of occurrence of lead ores generally, it may be said that they are found under a variety of circumstances. In the first place, they are exploited in regular veins or mineral lodes. The following diagram (fig. 4), based on the researches of Dr. C. Le Neve Foster,*

shows that in certain instances the fissure forming the lode was filled with bands of mineral matter

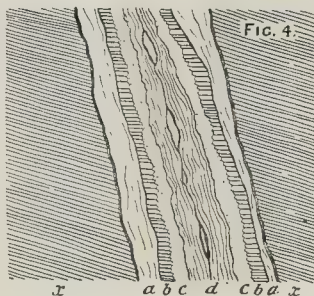


FIG. 4.—Section across a lead vein, *Wheal Mary Ann*, near Menheniot, Cornwall.

a = Band of Chalcedonic Quartz. b = Vitreous Quartz. c = Galena. d = Chalybite. x = Slate through which the vein runs.

deposited in regular order. Thus the two sides next to the "country rock" (slate), are lined with chalcedonic quartz (a); then, inwards, follows a layer, on each side, of vitreous quartz (b); succeeded by bands of galena (c) disposed likewise; the centre of the fissure being partially filled by chalybite (carbonate of iron). The student will remember that these veins are not pipes, but filled-up fissures stretching, perhaps, for many miles over the country, and penetrating to an unknown depth. It would seem that the history of such a lode as that depicted was somewhat as follows:—After the fissure was formed, by earth movements in the slate, the two walls became encrusted by chalcedonic quartz; there was then a cessation of deposition, accompanied it may be by movements which widened the fissure. Conditions were then present by which another kind of silica, vitreous quartz, was formed as a thick crust on the chalcedonic material. Another pause, and solutions, or vapours, laden with lead, put in an appearance, and left a deposit of galena on the walls on both sides. Finally, iron was introduced, and practically filled up what remained of the fissure. These are the broad features of the lode. The student sees that the actual thickness of any one of the bands of mineral is controlled entirely by local circumstances. The galena may accumulate in places as a band some two or three inches in thickness, and may, a little farther down, thin out to a mere streak not worth working. In other mines, this valuable metal may alternate with vein-stuff a number of times, so that, instead of two bands in the vein, there may be twenty or thirty.

In Derbyshire, at the Mill Close mine, near Darley Dale, lead is found in veins associated with ores of zinc (presently to be described), iron pyrites, calcite, and fluor-spar. As usual, a small proportion of silver accompanies the lead, but we were informed that it is not extracted. In reference to the geological age of the deposits in which lead ores occur, in this country they are chiefly of the Carboniferous period, and are seen penetrating the thick limestone near the base of the series. At the same time, the Foxdale mine in the Isle of Man is an extremely productive lode in granite; and we have seen that in Cornwall veins are found in slate. In the last-mentioned county it was formerly supposed that lead was confined to veins having a meridional direction, but the discovery of the lodes at Chiverton, which have an east and west bearing, put an end to the idea. Mr. Brenton Symons in his work on the "Geology of Cornwall," p. 96, remarks that the association of plumbiferous veins with slates, still further removed than those of copper from granite, is unquestionable; but that a considerable amount of metamorphism was necessary to ensure productiveness, is shown by the neagre and barren lead veins in slates that are comparatively unaltered. Small quantities of lead ore have been obtained from St. Erth, Phillack, and Gwinear, but the lodes are of no value in that part of England west of the Carn Menellis range. The Cornish lead ores were much esteemed for the large proportion of silver they enclose.

But it must not be imagined that all lead ore is obtained from fissures; it is found also in stratified rocks, when it commonly replaces some

other mineral. Thus, near Bridgend, in Glamorganshire, the Rhoetic beds contain a quantity of the metal disseminated in little lumps throughout certain horizons. Again, in beds of similar age (Triassic), at Mechernich, in Prussia, lead is extensively exploited in sandstone. Dr. Le Neve Foster remarks* that the ore exists in the form of little concretions of galena and grains of quartz, but these are not uniformly distributed through the sandstone. The concretions are from one-twenty-fifth of an inch to one-eighth of an inch in diameter, and are harder than the surrounding sandstone, which is generally very friable. The amount of metallic lead in the sandstone is between 2 and 3 per cent.; but the concretions themselves contain from 20 to 24 per cent.

No lead deposits are better known than those of Leadville, in Colorado, thanks to the careful researches of Mr. S. F. Emmons.† The most valuable ores are found in the vicinity of the junction of white porphyry with blue limestone of Carboniferous age. Along the plane of contact the limestone has been metamorphosed, as it were, by a process of gradual replacement, by galena, or the original constituents. The lead is silver-bearing, and in addition to galena, the varieties cerussite and kerargyrite occur in association with the hydrous oxides of iron and manganese, also with chert, quartz, clay, heavy spar, &c. The vein appears to have been formed through the agency of aqueous solutions which took up their mineral contents from the porphyry, and brought about the alteration of the limestone as they penetrated into it.

From the above observations, therefore, it will be seen that lead ores, though principally occurring in veins, or fissures properly so-called, are found also in stratified rocks, such as limestones and sandstones disseminated throughout the clastic constituents of those rocks. Further, they do not seem to affect any particular class of beds when existing in veins, but run alike through aqueous, igneous, and metamorphic rocks. It seems probable, however, that the process of the original formation of the ores was accompanied by heat, though the latter might not have been very intense.

Zinc.—This metal is very important to us from the circumstance that it is used in so many alloys. Native zinc is said to have been found in Australia, though its occurrence is not altogether a well-established fact. The ores from which the greater part of the zinc of commerce is derived are:—

1. *Calamine*, carbonate of zinc (zinc, oxygen, and carbonic acid), containing about 52 per cent. of pure metal; the latter, however, is often partly replaced by iron, or manganese, and a little lime.
2. *Blende*, sulphide of zinc (zinc and sulphur), with about 66 per cent. of pure metal.
3. *Zincite*, red oxide of zinc (zinc and oxygen), having about 80 per cent. of pure metal.

4. *Hemimorphite*, silicate of zinc.

The first-mentioned is the principal ore treated in this country; it is usually of a brownish tint, and is found both in beds and veins associated with galena and iron and copper ores. Blende, known to miners as "Black Jack," is next in importance. It is lustrous, occurring as black shining crystals, the dark colour being due to sulphuretted of iron; but sometimes it is of a brown or yellowish tint. Certain varieties resemble tin-stone, but may be easily distinguished from that valuable material by their perfect cleavage and relative softness. Red zinc ore would be white if it contained no iron or manganese. It is found massive, foliated, granular, or in sparsely-distributed grains. The manganese impurities may occur up to 12 per cent. of the whole mineral. When exposed to the action of the weather, the surfaces of this metal become encrusted with carbonate of zinc of light yellow, almost white, colour. It is a very valuable ore, but only occurs at two or three places, in the United States. Hemimorphite, the silicate (or electric calamine, as it is called by some, on account of its development of electric properties when heated), is found almost everywhere associated with the other zinc ores alluded to, but is not so important a source of the metal.

Cadmium.—This metal is briefly described here as being closely allied to zinc in its mode of occurrence. It is a white, ductile material, found in nature as a sulphide, and also in small quantities in zinc ores. The sulphide contains about 77 per cent. of cadmium; in practice, however, the metal is obtained from calamine and zinc blende. The yellow sulphide is used as a paint.

* "Trans. Roy. Geological Soc., Cornwall." Vol. IX., p. 153.

* "Ore and Stone Mining," 1894, p. 55.
† "Geology and Mining Industry of Leadville," 1886, (Monograph of U.S. Geol. Surv.)







"HERMES PSYCHAGOGOS" FRIEZE-PANEL.—DESIGNED BY MR JOHN STAINES BABB.

OBITUARY.

MR. JAMES RENWICK.—In a recent number the *American Architect* gives some particulars as to the life and work of the late Mr. James Renwick, by whose death, it observes, the profession of architecture in America loses one of its most honoured members. Mr. Renwick was born in New York in 1818. His father was Prof. James Renwick, of Columbia College, and the son graduated from this college at the age of seventeen, and immediately devoted himself to the active study of engineering and architecture. In those days, there was no much distinction between the engineer and the architect, and young Renwick found field-work on the Erie Railroad, and the Croton Aqueduct, suitable to the profession which he had chosen. Within a very short time after his graduation, however, a competition was invited for designs for a new church, which was to be built in what was then the residence quarter, at Broadway and South-street. Young Renwick sent in a design, which was adopted, and carried out. The tradition among New York architectural students used to be that Renwick was only eighteen years old when he won this competition. After an interval, during which Mr. Renwick superintended the construction of the District Court building on Fifth Avenue, he entered into competition for another important church, the Catholic Cathedral, on Fifth Avenue, and won this also. These works, with Mr. Renwick's family and social relations, brought him many commissions. In New York alone, he built the Stock Exchange, Booth's Theatre, and the Young Men's Christian Association Building, the Foundling Hospital, and the Wm. W. Smith Lunatic Asylum, besides St. Bartholomew's Church, and the Church of the Covenant, and a multitude of smaller buildings, and he was also much employed in other parts of the country. For the past ten years or so his work had been carried on under the partnership of Renwick & Aspinall (now Renwick, Aspinall, & Renwick).

GENERAL BUILDING NEWS.

EXMINTER CHURCH RESTORATION.—At a recent meeting of the restoration committee of this church, it was unanimously decided, on the motion of the vicar, seconded by the Earl of Devon, to remove the west gallery and to open the lower, in addition to the general restoration of oak roofs and reseating in oak already decided upon. Messrs. Andrews, of Teignmouth, having withdrawn their tender, the work has been entrusted to Mr. Herbert Reed, of Exeter. The architects for the restoration are Messrs. J. W. and S. W. of Newton Abbott.

NEW SCHOOLS, GOLLEAR.—At the monthly meeting of the Golear School Board held on Thursday last week it was decided to build new schools in Royd-street to accommodate 400 children. Mr. J. Berry, of Huddersfield, was appointed architect.

RESTORATION OF FARNWORTH CHURCH, LANCA-SHIRE.—On the 22nd inst. the parish church of St. Luke, Farnworth, was re-opened by the Bishop of Liverpool, after restoration and redecoration. The old pews have been removed, and new ones of oak substituted. A carved oak screen now divides the chancel, and a new oak ceiling encloses the organ-chamber. The renovation scheme has also included the removal of the organ on the north side. The church will be heated by system of low-pressure hot water. A new organ, encased in oak, has been fitted into the organ-chamber, this being the work of Messrs. Peter Connacher & Co., of Huddersfield. The carving of the pulpit, lectern, &c., have been done by Messrs. Hatch & Sons, of Lancaster, while Messrs. Tharpley & Hunt, of the same city, have supplied additional stained glass where it was needed. The architects of the restoration were Messrs. Austin & Paley, of Lancaster, and the contractors, Messrs. Woods & Sons, of Bootle. The cost of the whole restoration, exclusive of special gifts, was 4,000*l*.

CHURCH EXTENSION AT CHORLTON-CUM-HARDY, LANCA-SHIRE.—On the 20th inst. the corner-stone of the new south transept of St. Clement's Church, Chorlton-cum-Hardy, was laid. The church itself, which replaced a very ancient structure, was built some thirty-five years ago. A north transept was afterwards added, and the addition is a replica of it. It will provide accommodation for something over 100 worshippers, and will cost to complete about 1,500*l*. Mr. W. Higginbottom (Messrs. W. & G. Higginbottom, Manchester) was the architect.

SCHOOLS, CAMBORNE.—The foundation-stone of Camborne New National Schools was laid on the 17th inst. The architect for the new building is Mr. Sampson Hill, of Redruth, and the contractors are Messrs. Moyle & Michell.

AN OLD LAWYER'S BUILDING, EDINBURGH.—The Dean of Guild Court have just passed plans for altering one of the few remaining ancient buildings of the High-street. The tenement adjoins the Assembly Hall, and was purchased last year for the Church of Scotland. It is situated in a court known as Boswell's Court, so called from one Dr. Boswell, who lived there about 1760. The house, however, is very much older than that, and even without any record of its history, it must have been in existence at least 100 years before. The front, to Castle Hill, is in polished ashlar, with numerous lofty and narrow windows, and still retains

fragments of the moulded stringcourses and a goodly row of dormer gables, with finials of varied designs, now much weatherworn. The original doorway, which is also the door to an old-fashioned turret stair, remains with its mouldings fairly entire. Over it is the lintel, with a panel and inscription which speaks plainly as to its age, "O Lord in the is mi traisit, and some initials. The plans, now passed, will complete the improvement scheme of the Assembly Hall, originated and carried through so far successfully by the efforts of the Rev. Dr. Mair, of Earlston. In these alterations the architects, Messrs. Hardy & Wight, have provided on the two lower floors ample accommodation, much needed by the Assembly. Committee-rooms, conversation-rooms, &c., and the two upper floors are arranged as dwelling-houses. The external aspect of the old building will be carefully preserved in all characteristic features, and the rough walls roughcasted and repaired.—*Scotsman*.

TOWER, EMMANUEL CHURCH, COMPTON GIFFORD, DEVON.—On the 17th inst. the Mayor of Plymouth, Mr. W. Law, laid the memorial-stone of the tower to be erected at Emmanuel Church, Compton Gifford. The ceremony marks the first stage in the erection of this church. The main walls, which are 4 ft. thick, are built of local limestone, with Douling stone plinth and dressings. The first stage of the tower will form a new entrance porch 13½ square, which is to be paved with slabs of Portland stone and rubbed Delabole slate. A circular staircase in one corner leads to the belfry, and the entrance is continued upwards to give access to the belfry. There will be access by means of ladders from this stage to the parapet, which runs around the top of the tower. Some carved work is introduced at the entrance, and the belfry stage is marked by long traceried openings on all four faces. The height of the tower will be 74 ft., and the spire 79 ft. high, making a total height of 153 ft. without the wrought-iron finial. Though the present contract only includes the tower, arrangements have been made whereby the spire will be proceeded with immediately on the completion of the tower. The spire will spring from the tower with an octagonal drum, with hexagonal turrets at the four corners. There are four open-work dormers—one central with each face of the tower. The architects are Messrs. Rogers, Bone, & Coles, of Westminster; Mr. Jonathan Marshall, of Plymouth, is the builder; and Mr. C. E. Perkins, also of Plymouth, is the clerk of the works.

ADDITIONS TO THE ALBERT MEMORIAL MUSEUM, EXETER.—On the 29th inst. the newly-added portion of Exeter's memorial to the late Prince Consort, the south-east wing of the Albert Museum, was opened. The building occupies a piece of ground which abuts on Upper Paul-street and Bradninch-place. What may be termed the front, faces Upper Paul-street, and the style of architecture deviates slightly from that of the old building. The walls are of Pocombe stone with Hamhill dressings; the huge columns in front are of Devonshire granite polished. The tracery of the windows is of Hamhill stone. From the main entrance of the Museum in Queen-street there is a passage-way, on each side of which there is a class-room, 30 ft. by 22 ft., with wooden dados, and floors of wooden blocks. On the Paul-street side there is a Museum Room, 57 ft. 9 in. by 41 ft. 6 in. Upstairs and immediately above this Museum Room, there is a large apartment, presumably set apart for the Art Gallery. It contains a large recess with columns at one side, and by way of an arched doorway leads in to the Ethnological Room, a very narrow apartment. Upstairs there are also two lecture-rooms, one about 48 ft. by 22 ft., and the other 48 ft. by 27 ft. In the downstairs portion of the new building, at the rear of the class-rooms and approached by steps, is a small laboratory adapted for the preparation of specimens, but which will be used at present in connexion with technical education. There is a lecture-room for teachers of chemistry the same size as the chemical laboratory. The laboratories are fitted with an air-pump, balances, and numerous apparatus for the use of the students. The premises throughout are fitted with the electric-light apparatus, and they are to be heated with hot water. Plenty of light has been secured by open ceilings and a liberal use of glass in the roofs, light being conveyed to the lower rooms not only by means of windows but by the flooring of the large upper room being largely composed of glass. The architects are Messrs. Fulford, Tait, & Harvey; the builder is Mr. Woodman, Messrs. Easton & Sons supplied the stonework. The carving in connexion with the new additions has been carried out by Messrs. Harry Hems & Sons, Exeter.

SCHOOLS, WATFORD, HERTS.—At a meeting of the Watford School Board, held on the 22nd inst., the design submitted by Mr. C. P. Ayres, of Watford, architect, was selected for the new schools to be erected in a Farley-street, on land recently purchased from the Earl of Essex. The schools will accommodate 1,000 children, and the approximate cost is 10*l*. per head including central halls.

SANITARY AND ENGINEERING NEWS.

SEWERAGE WORKS, YORK.—The new sewerage works at York have just been completed. In the construction and development of the scheme three

objects had to be attained—viz. (a) to remove as speedily as possible from the houses in the city all sewage, slops, and foul liquid; (b) to give the existing sewers, which now discharge under water into the river, a free outfall at a lower level, and so prevent backing-up; (c) to prevent the pollution of the river Ouse by the crude sewage of the city. To obtain these results a system of intercepting sewers have been constructed. Speaking broadly, they follow the banks of the river and the natural valleys in the city. The existing branches have been connected with the new system, so that instead of the sewage flowing into the rivers or streams, it is now conveyed by gravitation to the eastern boundary of the city, on the left bank of the river, to the pumping station at Fulford. At this point the main sewer is a little more than sixteen feet below summer level of the river. The total length of new sewers is 17 miles 527 yards, as under:—Brick sewers, varying from 6 ft. 9 in. by 4 ft. 6 in. to 2 ft. 9 in. by 1 ft. 10 in., 2 miles 513 yards; iron sewers, varying from 3 ft. 4 in. to 9 ft. internal diameter, 1,044 yards; stoneware sewers, varying from 2 ft. to 9 in. internal diameter, 14 miles 730 yards; total length, 17 miles 527 yards. There are three inverted siphons under the river, connecting the intercepting sewers on one bank with those on the other. In addition to the construction of new sewers, works have been carried out in various parts of the city for the removal and interception of old drains, and the general arrangement of the scheme of the sewers has been designed not only to secure the collection of the sewage in the most adequate manner, but in a special degree to suit the low-lying character of the land upon which the city is situated, and secure the greatest possible fall towards the point at which the sewage reaches the pumping-station. The works have been executed by the following firms:—Main intercepting sewers, Mr. A. Kellett; Fulford pumping plant, Messrs. J. Watt & Co.; Fulford pumping-station, foundation, walls, Messrs. Parker & Sharp; Fulford pumping-station buildings, Mr. A. Kellett; Naburn treatment works, Messrs. Parker & Sharp; sludge-pressing plant, Messrs. Goddard, Massey, & Warner. Mr. James Mansergh (Vice-President Inst. C.E.) has acted as consulting-engineer to the scheme, and the work has been carried on under the personal supervision of Mr. James McKie, A.M. Inst. C.E., as resident engineer. The total estimated cost of the works, for which the Council has obtained borrowing powers, is 191,100*l*. The cost of the works already completed is 186,120*l*.

OSSETT SEWAGE DISPOSAL.—An inquiry was held on the 23rd inst. at Ossett by Colonel W. M. Ducat, R.E., into the application of the Ossett Town Council for borrowing powers for 3,300*l*. required for the extension of their eastern outfall works of sewage treatment. These works were constructed nearly twenty years ago by Mr. M. Paterson, C.E., of Bradford, who now explained the proposed extension, consisting chiefly of four new settling tanks, holding 180,000 gallons, and the preparation of seven acres of land for filtering purposes, besides a screening-tank, sewage-wheel, &c. The Council deal with the whole liquid refuse of their outfall district, both trade and domestic.

WATER SUPPLY OF PORTLAND, OREGON.—According to a recent report of the British Vice-Consul at Portland, the new waterworks, supplying that city with 25,000,000 gallons a day, and costing 650,870*l*., are completed. The water is taken from Bull Run River, a clear mountain stream flowing from a lake near the base of Mount Hood, and brought in a pipe twenty-four miles long to a reservoir 404 ft. above low water on the east side of the river near Portland. From thence it is carried across the river through a submerged pipe to a reservoir in the City Park, six miles distant, at an elevation of 290 ft. above the levels of the city streets. These high-service reservoirs on the east and west sides of the river are connected with low-service reservoirs, but the water can be supplied direct to the city mains without passing through the latter. The four reservoirs have a capacity of 67,500,000 gallons, and the supply is inexhaustible.

MISCELLANEOUS.

IMPROVED LETTER-CARDS.—Messrs. Langley & Son (London) send us specimens of their patented folding letter-card within which an extra leaf is inserted, of smaller size than the outer leaf (so as to clear the line of perforation for opening), giving space for a larger letter. If the consent of the Post Office has been obtained, no doubt this arrangement will be a convenience to correspondents.

LIVERPOOL ENGINEERING SOCIETY.—A party of the members of the Liverpool Engineering Society paid a visit to the Lytham Sewerage Works, at the invitation of Dr. L. Fisher, J.P., Chairman of the Urban District Council. Mr. Paterson, of the Post Office, explained that the system experimentally adopted at Lytham is that known as the "Hermite" process, which briefly consists of electrolyzing sea water, in order to produce chlorine, and then passing this antiseptic through the sewers, which has the effect of sterilising the sewage and of preventing the evolution of sewer gases.

ELECTRIC LIGHTING AT CARDIFF.—At a recent meeting of the Cardiff Lighting and Electrical Com-

mittee, the Mayor presiding, the Borough Engineer Mr. W. Harpur submitted the estimate for the electric works and plant, which showed that the estimated sum of 32,500l. had been exceeded by 5,000l., and he recommended that they apply for powers to borrow an additional 7,500l. for the proposed extension and other purposes. He also submitted an estimate of the working expenses for the ensuing six months for the whole of the lighting department (including gas and electricity), which he put at 5,580l. 10s., a sum almost identical with that of the last budget, which was 5,556l.

EAST RIDING ANTIQUARIAN SOCIETY.—On the 15th inst. the members of this society visited Scarborough Hall (once the home of the Earls of Northumberland, now an uninhabited house), to uncover some mounds in the park. The excavations had been undertaken by Mr. J. R. Mortimer. The field under observation had no less than 170 barrows in it, of which three were uncovered, varying in size from two to ten yards in diameter. The party, numbering upwards of fifty, then moved to the church, where Mr. J. R. Boyle, F.S.A., explained the chancies and stained-glass windows.

NATIONAL REGISTRATION OF PLUMBERS.—The annual meeting of the Devon and Cornwall Council of the National Registration of Plumbers was held at Plymouth on the 20th inst. Mr. S. J. Page presided. Mr. W. J. Addiscot and Mr. G. H. Ken (Cornish Bank) were re-elected secretary and hon. treasurer respectively, and Messrs. W. N. Elliott, Harvey, and Wright were appointed auditors. The report was adopted. Mr. Wright moved the rescinding of the following resolution adopted by the Council at the year:—"That in future all prizes and certificates won under the graded syllabus of the Worshipful Company, within a radius of ten miles, be given out at a Council meeting; beyond that distance they may be given out in the immediate neighbourhood; but all certificates of registration must be given out at Plymouth, where the candidates must take them up and sign the declaration." Mr. Ackland seconded, and the motion was carried unanimously. Mr. Wright then moved, "That the prizes be delivered under the auspices of this Council, and in the towns and districts where they are obtained." Mr. Perrin seconded, and it was carried. It was decided to entertain the suggestion of the Bristol district to send delegates to a conference to be held in that city for the purpose of considering a new rule in the examinations of the company. The secretary and Messrs. Pearse and Wright were appointed delegates.

NOTES FROM FRANCE.—The Department of "Postes et Télégraphes" has commissioned M. Eugene Grassie, the decorative painter, to make a new postage-stamp design. It may be remembered that the competition last year for a design of a new type produced nothing available. A monument to Edmond Guillaume, the architect to the Louvre and Tuileries, has just been inaugurated at the Mont-Parnasse Cemetery. It is the work of M. Henri Guillaume, and consists of a stele with a bronze medallion portrait by Chapu. M. Bernard, architect, of Asnières, has obtained the first premium in a competition for a group of schools in that township. The new line of railway from Lozanne to Lamure (Rhône) will shortly be opened; it is eventually to be prolonged to Paray-le-Monial. This last portion of the line requires the construction of a tunnel 5 kilometres long and a viaduct 500 metres long. The two works together will cost 12 million francs. At Hautefage, near Agen, an altar in white marble has been found, dating from the second century, of unusual form and bearing a number of inscriptions. A bust of President Carnot was uncovered last week, at Cante. It is the work of M. Injalbert, the well-known sculptor. The town of Rouen is making preparations for an artists' exhibition to be held there in 1896. The military engineering department has under consideration the prolongation of the strategic railway of St. Laurent from Jura to Geneva, by piercing a tunnel through Mt. Francille. There is to be an industrial exhibition at Tunis in 1897. M. Henri Picou, a historical painter who enjoyed some celebrity at one time, has died at Nantes, at the age of sixty-nine. He was a pupil of Paul Delaroche and Gleyre, and had received medals in the Salons of 1838 and 1857. The works of the painters who have competed for the Prix de Rome are at present being exhibited at the Ecole des Beaux-Arts. Those of the competitors in the architectural class will be exhibited on and after the 31st.

COMPLETION OF BURNS' MONUMENT AT AYR.—The Burns' monument at Ayr, unveiled in 1891, will, says the *Scotman*, be completed by a bronze panel about the latter part of next month, representing "The Parting of Burns and Highland Mary," the sculptor being Mr. George E. Bissell, Poughkeepsie, New York. Three sides of the monument have already been filled. The fourth panel, fronting the west, which was left for friends in the United States to complete, will therefore soon be placed.

THE COMMISSIONERS OF SEWERS.—A report by the City Engineer showing the effect on city traffic of the opening of the Tower Bridge was brought before the Commissioners of Sewers at their last meeting on the 23rd inst., from which it appears that by this construction, London Bridge has been

relieved to the extent of about 5,200 vehicles per day, and Eastcheap and Fenchurch-street by 2,200 and 2,000 vehicles respectively. At the same time the daily traffic through the Minories, Houndsditch, Liverpool-street, and Bishopsgate-street has increased, in the first-named thoroughfare by 2,200 vehicles daily, the second by 700, the third by 900, and the last by 600. In the central and western portions of the City, the amount of the traffic did not appear to have been affected by the improvement. The meeting was made special to consider a motion by Mr. H. H. Bridgman to rescind a portion of the resolutions passed at two previous meetings, so far as related to the relaying of the asphalt in the Poultry during ordinary working hours. This was the question of continuous working over again in a modified form. A letter was read by the Clerk, in which the Val de Travers Asphalt Company declared that it was difficult to fix the definite time that would be saved in working by two shifts, and that it would increase the cost of working by 15 per cent. The company was of opinion that the better course would be to have the work done by one set of men working overtime. Mr. Bridgman eventually consented to withdraw the motion.

THE SANITARY INSTITUTE.—At an examination for Inspectors of Nuisances, held at Norwich on Friday and Saturday, July 19 and 20, the following fourteen candidates were certified, as regards their sanitary knowledge, competent to discharge the duties of Inspectors of Nuisances: F. W. Benstead, Plumstead; F. R. Blandford, Reading; J. Cossey, Lodon; H. Dunsmore, Forest Hill, S.E.; A. J. Field, Bromley; G. A. Hawes, Norwich; T. W. Howes, Norfolk County Asylum, Thorpe; C. B. W. Lloyd, Manor Park, E.; J. Marshall, Watton; T. R. Mayes, Brighton; J. Offer, Handcross; C. J. Parfitt, Maidstone; Newport, F. Read, Norwich; J. W. Richford, Wells, Norfolk.

LEGAL.

GENERAL BUILDING LINE CASE.

IN THE COURT OF APPEAL.

THE case of Lavy & Upjohn v. the London County Council came before the Court of Appeal, composed of Lords Justices Lindley, Lopes, and Rigby, on the 16th inst., it being the appeal of Messrs. Lavy & Upjohn, the owners of a house known as 391, City-road, in the parish of Islington, from the decision of a Divisional Court of Queen's Bench, given on a case stated by a Metropolitan Magistrate. Upon July 24, 1894, the appellants were charged with having, at 391, City-road, unlawfully erected a certain structure beyond the general line of buildings in the City-road without the consent in writing of the London County Council, contrary to Section 75 of 25 & 26 Victoria, cap. 102; Section 10 of 45 and 46 Victoria, cap. 14; and 51 and 52 Victoria, cap. 41.

The facts were shortly as follows:—The house, 391, City-road, was 38 ft. from the footway, and it had a forecourt which for many years was bounded by a brick wall 2 ft. or 3 ft. high, 9 in. thick, with an iron railing 5 ft. 6 in. in height. The appellants from time to time applied for leave to build upon the forecourt, but the applications were refused. Prior to 1894 the appellants erected on the dwarf wall a hoarding for advertising purposes, which was placed against the railings so as to get the support, and it had struts for additional support. The respondents (the County Council) gave notice to remove it, and on May 5, 1894, the hoarding was removed and replaced by what was now complained of—viz., a wall 11 ft. high, 14 in. thick, with its face put back 4 in. from the line of the old dwarf wall, so that there might be a ledge to support it. On July 11 the summons was taken out, and on July 13 the architect gave his decision under Section 75 of 25 and 26 Victoria, cap. 102, as to what the building line was. That decision was appealed from, and on July 24 the appellants appeared to the summons, and the respondents asked for an adjournment, which was granted upon the terms that the rights of all parties as they were on July 24 should be preserved—namely, that the matter was to be in the same position as if the magistrate had begun to hear the appeal on July 24. Several adjournments took place from time to time, and on October 19 the architect's decision was confirmed by the appellate tribunal. By that confirmation the building-line was finally decided to be the line of the house 391, City-road. The magistrate found that the wall was erected as an advertising station, but that it was intended also to serve as a boundary-wall for the forecourt, and on December 7 he gave an order upon the appellants to demolish the erection, and found, so far as it was a question of fact, that it was a structure in front of the general line of buildings. No consent to the erection being made was ever given by the respondents. The Divisional Court overruled an objection on the part of the appellants that the architect's decision had not been given on the day of the issue of the summons, and also held that the wall in question was a structure or erection within the meaning of the prohibition, and gave judgment in favour of the County Council, from which the owners, Messrs. Lavy & Upjohn, now appealed.

At the conclusion of the arguments the Lords Justices dismissed the appeal, with costs.

Mr. McCall, Q.C., and Mr. R. C. Glen appeared for the appellants, and Mr. Channell, Q.C., Mr. Forman, Mr. Daldy, and Mr. F. K. North for the County Council.

ALLEN AND ANOTHER v. THE LONDON COUNTY COUNCIL.

IMPORTANT CASE.

THE case of Allen and another v. the London County Council came before the Court of Appeal, consisting of Lords Justices Lindley, Lopes, and Rigby, on Monday last, for judgment, it being the appeal of the plaintiffs from the decision of Mr. Justice Wills and Mr. Justice Wright, sitting as a Divisional Court of Queen's Bench, on a special case stated by a metropolitan police magistrate, who made an order for the demolition of a building in the metropolis as being beyond the building line. The case was reported in the *Builder* for July 6. The facts are shortly these:—A complaint was made to the magistrate by the London County Council that the appellants began to erect a building beyond the general line of buildings on the north-western side of Birchington-road, Kilburn, without the consent of the County Council, contrary to Section 75 of the Metropolitan Management Act, 1862. It appeared that the appellants, on November 13 last, commenced to build four shops and houses upon the land at the north-western side of Birchington-road, in which road the building in question is situate, and that the building in question would project beyond the prolongation of the said general line. The appellants' contention was, that the architect had not, by his certificate, found that the building was in the street, place, or row of houses; described as the north-western side of Birchington-road, and that if he had so found he had placed the building in a "street, place, or row of houses" in which the same was not situate. The respondents' contention was, that the certificate had determined that the building was situate in the Birchington-road, and that such determination was binding on the magistrate. The learned magistrate felt bound by the decision in the case of the "London County Council v. Cross," and directed the demolition of so much of the building as was beyond the line, and the Divisional Court upheld his decision, hence the present appeal.

The questions for the Court to determine were (1) Whether the certificate showed that the house in question was situate in the street, place, or row of houses on and for which the general line of buildings was determined; (2) Whether it was the duty of the architect to decide and find the situation of the appellants' building, and, if so, whether his decision was binding on the magistrate.

Lord Justice Lindley, in giving judgment, said that he was of opinion upon the construction of the certificate that it did decide that the plaintiff's house was situate in the Birchington-road. The question was whether, under Section 75, this point was to be decided by the Superintending Architect. Continuing, he (his Lordship) said that the following circumstances must be taken into account in order to justify an order of demolition under Section 75—viz., (1) There must be a building, structure, or erection of some sort; (2) That building, structure, or erection must be erected with the written consent of the Metropolitan Board of Works (or now of the County Council). (3) That building, structure, or erection must be in some street, place, or row of houses. (4) That street, place, or row of houses must have a general line of building. (5) This line of building, viz., the line of building of the street, place, or row of houses in which the building complained of is situate, must be decided by the Superintending Architect, appointed by the Metropolitan Board of Works (or now by the County Council). (6) The building, structure, or erection must be erected beyond the line so decided. What was left to the decision of the architect was the existence and exact position of the general line of building of the street, place, or row of houses (if any) in which the building, structure, or erection complained of was situate. In order to justify an order of demolition under Section 75—viz., (1) There must be a building, structure, or erection of some sort; (2) That building, structure, or erection must be erected with the written consent of the Metropolitan Board of Works (or now of the County Council). (3) That building, structure, or erection must be in some street, place, or row of houses. 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certificate is applicable. This was the point on which Lord Watson and Lord Bramwell differed in the case of "Barlow v. The Vestry of St. Mary Abbott's." A careful perusal of Lord Herschell's judgment had led him to the conclusion that he agreed with Lord Watson, and that Lord Fitzgerald took the same view. There was much to be said for that interpretation of the Act, for the object of the Act being to regulate lines of building, the architect, rather than the magistrate, seemed naturally to be the person to say to what line of building a particular house should conform. The general line of building which the architect was to decide was "such general line," and by "such" was meant the general line for the street, &c., in which the house in question was. The architect might no doubt assume, without deciding, that the building complained of was in a particular street, place, or row of houses, and simply certify the general line of buildings of that street, &c., leaving the magistrate to determine whether, after all, the building was in the street, &c., to which the certificate applied. But that would be to deprive the architect's certificate of half its value, and the interpretation which left him to decide what building line was to be referred to, seemed to be preferable to an interpretation which left that question to the magistrate. For those reasons, and thinking as he did, that that view was more in conformity with the decision of the House of Lords in "Barlow's Case" than the interpretation contended for by the appellants, he came to the conclusion that the appeal ought to be dismissed.

By Mr. Channell, Q.C., and Mr. Macmorrison appeared as counsel for the appellants; while Mr. Horace Avory and Mr. Daldy represented the respondents.

LONDON COUNTY COUNCIL v. J. SANDERS.

At the Marylebone Police Court a few days since John Sanders, a builder, of 49, Lisburne-road, Hampstead, was summoned by William Smallpeice, District Surveyor for East Hampstead, for using mortar the ingredients of which did not conform to the requirements of the by-laws of the London County Council. The evidence was that the defendant was the builder of a house known as 5, Constantine-road, Hampstead, in the erection of which he had used mortar which was deficient in lime to the extent of fifteen degrees. Mr. Nimmo, for the defence, admitted that his client had committed a technical breach of the by-law, but contended that similar mortar had been commonly used in the metropolis for years past. He added that if the prescribed amount of lime was used the mortar would set too quickly. A specialist called for the defence stated that the mortar used was good enough for "speculative building," but it was not "high-class." The magistrate, having remarked upon the absence of any professional gentleman to conduct the case for the London County Council, observed that the defendant's own witness had damned the case by his faint praise of the article used. It was clear that it was not up to the standard which the public had a right to expect. The public were absolutely at the mercy of the builders, and if they used inferior mortar it was nothing less than a fraud upon the persons who took the house. He imposed a fine of 40s. and 23s. costs.

CASE OF EXTRAORDINARY TRAFFIC: RULLINGDON HIGHWAY BOARD v. J. PLUMRIDGE.

At the Bullingdon Division Petty Sessions, held at the County Hall, Oxford, on the 14th inst., Jonathan Plumridge, timber merchant, High Wycombe, Bucks., was summoned at the instance of the Bullingdon Highway Board, to show why an order for payment of 64/2s 6d. should not be made on him owing to certain extraordinary traffic upon the highway at Great Milton.

Henry Matthews, roadman, Great Milton, said he saw Mr. Plumridge's engine with two wagons going down to Hasleley Cope at the beginning of March. They came back loaded, and he should say that the engine, trucks, and load weighed about 30 tons. The load comprised about twelve trees. This was a district road, and most of the traffic would be of an agricultural character. The heaviest wagon would weigh about two tons and a half. When the engine and wagons had passed over he saw a number of ruts in the road. He first noticed the ruts on March 1, and as the heavy loads continued to pass the ruts became worse. The wheels broke through the metal of the road. The repairs necessary were considerable, the road having to be re-made with about 100 tons of steam-roller was also required. The ruts in some places on the road were a foot deep and a yard wide.

Cross-examined: On March 1 the ruts were from 6 to 8 in. deep. He knew that a traction engine not belonging to Mr. Plumridge had stuck in the road ten feet in the morning to three in the afternoon about April 4. It was only partly on the road, having been driven on one side to allow a carriage to pass. The wheel on the road did not stick at all.

Other evidence of a similar description having been given,

Mr. Charles Ward Brabant, District Surveyor for the Bullingdon Highway Board, said the road in

question was 682 yards long, and was in fair condition before the damage was done. From January 1 to February 28 there was a severe frost, and after it broke up he received a complaint about the road. He saw it on March 15, and found deep and dangerous ruts in it. In some places they were 14 in. deep, the crust of the road being broken through and the clay displaced. Witness ordered temporary repairs, and subsequently received instructions to make the road good. The cost of the work was 64/2s 6d. In 1892 67/17s 6d. was expended in the district roads in the parish of Great Milton, which worked out to 12/16s 10d. a mile. In 1894 it was 97/1s., or 17/13s. a mile; and in 1895 104/7s 2d., or 18/19s 6d. a mile, an average of 89/8s 7d., or 16/5s 3d.

Mr. John Henry Goodson, District Surveyor for Watlington, said he went along the road at the beginning of April, and found it completely broken up. He thought the amount claimed was a moderate sum for making the road good.

Mr. Henry James Tollit, County Surveyor for Oxfordshire, said he saw the road, and found the surface broken through and the bed displaced. He thought the road was excessive.

This was the case for the plaintiffs. Charles Plumridge, son of defendant, said the first time the engine went to Hasleley was on February 27. It went again on March 1, March 4, March 5, and March 7. Each time they returned the following day. They never took more than one truck at a time up the hill, and had only one tree on each. On the last day two trucks were taken, but they went up the hill only at a time. There were no ruts made in the road, nor was it damaged in any way. On March 8 there was a thaw, and the road began to bend a little. After that day the engine went a different way, and never went up the hill again.

Cross-examined—He had heard what Mr. Brabant said about there being ruts 14 in. deep on March 15. He went over the previous day, and there were then no ruts whatever.

James Murrant, defendant's engine-driver, gave similar testimony, and entirely denied the damage to the road.

Cross-examined—Up to March 15 there were no ruts in the road.

Other evidence having been given, the Chairman said the Bench had come to the conclusion that, having regard to the construction of the road, the ordinary traffic of the district, and the condition of the weather, that injury was caused by extreme traffic and excessive weight of the defendant's traction-engine. They accordingly found in favour of the Highway Board, with costs.

ACTION TO RECOVER COMPENSATION IN AN ARBITRATION UNDER THE METROPOLIS MANAGEMENT ACT, 1862.

The case of the Mayfair Property Company, Limited v. The London County Council came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Kay and A. L. Smith, on Tuesday and Wednesday last, it being the appeal of the plaintiffs from a decision of Mr. Justice Wills in the Queen's Bench Division in an action brought by the plaintiffs to recover from the defendants compensation under the 74th Section of the Metropolis Management Act, 1862, for having been required to set back a new building situate at St. John's Wood. The case was reported in the *Builder* of May 11 last. The facts were shortly as follows:—The plaintiffs in December, 1892, acquired certain premises at the corner of Hall-road and Grove End-road, St. John's Wood, under a building lease for the purpose of immediately resubdividing the site. The old buildings were accordingly pulled down, and the plaintiffs immediately commenced to erect a large building to be let out in flats. The defendants thereupon required the plaintiffs to set their building back, in accordance with the certificate of the Superintending Architect, to a line which the plaintiffs alleged was at a greater distance than 50 ft. from the highway. The plaintiffs pulled down the building, carried it back to the line fixed by the Superintending Architect, and claimed compensation under Section 74 of the Metropolis Management Act, 1862. After the building had been completed the plaintiffs appointed an arbitrator to assess the amount of compensation to which they were entitled, but the defendants refused to have anything to do with the arbitration, on the ground that their notice was given under Section 75 of the Metropolis Management Act, and not under Section 74. The plaintiffs' submission was that the terms of the notice of the defendants came within Section 74, and that they were entitled to the sum of 7,490/10, which had been awarded them by the arbitrator, but the learned judge in the Court below gave judgment for the defendants with costs, hence the present appeal.

Mr. Channell, Q.C., and Mr. R. C. Glen appeared for the plaintiffs (the appellants), and Mr. Cripps, Q.C., and Mr. English Harrison for the defendants (the respondents).

Their Lordships, without calling upon counsel for the respondents, dismissed the appeal with costs.

CAPITAL AND LABOUR.

THE LONDON BUILDING TRADE.—On the 25th inst. the London Building Trades' Federation cele-

brated, in Hyde Park, the third anniversary of its formation. After the signing of the agreement with the master builders in 1892, which until last month governed the conditions of work in the building trade within a twelve-mile radius of Charing Cross, steps were taken to bring about a federation of all the trade unions in the building trade. The twenty-four unions now belonging to it have some 38,000 members in the London area. There were two platforms in the Park, at one of which Mr. Joseph Vardon, the secretary of the London Building Trades' Federation, presided, and Mr. Stevenson, the secretary of the United Builders' Labourers Union, at the other. The following were the two resolutions which were put and carried from each of the platforms:—(1) That this meeting of building trades workers considers that the action of the Central Association of Master Builders in terminating the agreement entered into in 1892 is both unnecessary and uncalled for, and if persisted in can have but one effect, and that the total disruption and dislocation of the building industry; and this meeting pledges itself to resist to the utmost any violation of the said agreement. (2) That this mass meeting of the workers employed in the building trade considers that the time has arrived when active steps should be taken to secure the direct representation of the building trades upon all local and municipal bodies, and pledges itself to use all legitimate means at its disposal to carry the same into effect; and it further resolves not to support any candidate for such bodies, who is not pledged to vote for trade union rates of wages and that conditions of work shall be observed on all contracts.

BRISTOL BUILDING TRADE DISPUTES.—As an outcome of a conference between representatives of the Bristol Master Builders' Association and of various trade organisations, Rule 11 has been amended to read as follows:—"Should a dispute at any time take place between any department of the building trade and their employers, or any question of disputed interpretation or infringement of these rules arise that cannot be mutually arranged between the parties affected, a Board of Conciliation shall be formed, composed of four employers and four members of the trade affected, to whom all questions shall be referred. The decision of the majority of such board shall be binding on all parties concerned. Such Conciliation Board shall meet within thirty-six hours of the information being laid. That, in case of an equal division each body shall appoint an arbitrator, and the two arbitrators shall themselves, in case of disagreement, appoint an umpire, the decision of such arbitrators, if unanimous, or of the umpire to be final, binding, and conclusive." The amended rule has been signed by the representatives of the bricklayers, labourers, carpenters and joiners, plasterers, and painters.

MEETINGS.

SATURDAY, JULY 27.

Architectural Association.—Visit to Charterhouse and Godalming. 1.30 p.m. train from Waterloo.

WEDNESDAY, JULY 31.

Institution of Junior Engineers.—Visit to the Ice Works and Cold Stores of the Linde British Refrigeration Company, Shadwell. 6.30 p.m.

SATURDAY, AUGUST 3.

Liverpool Engineering Society.—Visit to the site of the Elan Water Supply of the Birmingham Corporation at Rhayader, Radnorshire.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

13,328.—KILNS: J. O'NEIL.—This invention relates to kilns for burning and drying bricks, tiles, &c., in which the burning is effected on the down-draught system. A kiln is constructed having narrow flues or openings in the floor through which the hot gases pass, with floor spaces between, on which the goods can be stacked in parallel lines across the kiln. For regulating the flow of hot gases, and the heat of the kiln, a number of dampers are suitably arranged, by means of rods, for closing, wholly or partially, the aforementioned flues or openings.

13,367.—CHIMNEYS: H. FLETCHER.—For preventing down-draught in chimneys, a number of outlet holes are left in the shaft near the chimney top, each outlet opening into a short tube which points radially downward at an angle of 45 deg. In conjunction with these is employed an internal ring in the form of a truncated hollow cone, which is fixed in the chimney with its bottom edge below the outlet openings.


15,156.—FIREPROOF FLOORS: J. ROY.—This patent has to do with the manufacture of fireproof floors, and relates to the employment and arranging of joists and webbed slabs of freclay, the latter suspended from the joists by means of hooks, and forming, in conjunction with the joists, a continuous centering which is filled with concrete.

12,228.—VENTILATORS: J. JONAS.—Deals with a room ventilator consisting of two wheels which rotate in opposite directions, the fans being differently coloured, and provided with cut-out openings for the purpose of producing chamois-like effects.

2,876.—TRAP: R. BENNETT.—Consists of an intercepting trap similar in shape to those generally used, with the exception that, from the water-seal and to the overflow, the trap is made of a bell-shape, and terminates in a vertical chorded outlet bend, with an inspection or ventilating opening in the top.

8,465.—WEDGE: F. ROBINSON.—A wedge for preventing vibration in windows and doors. Consists of a narrow piece of metal having at one end a counter-sunk hole, and at the other a wedge-shaped piece, the thin edge of which projects at right-angles. The wedge is allowed to turn on a screw which fits through the counter-sunk hole.

8,453.—LATHS: W. ECKSTEIN and another.—Relates to metallic lathing for ceilings, &c., having flat or trough-



NOTTINGHAM.—For the construction of a new road at Bulwell, for the Corporation, Mr. Arthur Brown, C.E., Borough Engineer, Guildhall, Nottingham.
J. H. Vickers £2,300 0 0
Baker & Sons 8,955 17 5
J. Hawley & Son 5,171 11 5
J. Tomlinson 7,550 0 0
Thos. Smart 7,865 0 0
Logan & Hemmings 5,171 11 5
Nottingham 5,171 11 5
Hodson & Sons 8,950 0 0
* Accepted. † Withdrawn.

OSWESTRY.—For the erection of four houses, Ferrers-road, for Mr. Tom Leske, Mr. F. H. Shaylor, architect, 33, Willow-street, Oswestry.
Huxley £1,846 0 0
F. Davies 1,771 0 0
W. W. Southern 1,590 0 0
Oswestry 1,389 10 0
* Accepted.

PENZANCE.—For the construction of a sea-wall at the western promenade, for the Corporation, Mr. George H. Small, Borough Surveyor, Public Buildings, Penzance.
J. Shaddock £13,500 0 0
W. H. Stephens 14,775 0 0
J. C. & T. A. Lang 1 0 0
Geo. Sheilaker £10,300 0 0
A. Carker, Redruth 9,800 0 0
* Accepted.

PENZANCE.—For additions to Wesleyan school, Mr. J. W. Trounson, architect, 27, Clarence-street, Penzance.
Burnet & Trounson £274 17 6
Burnet & Son 448 10 0
Kd. Walters 654 12 6
Ford & Son 612 11 0
Trounson & Trythall, Heligraia, street, Penzance (accepted) £34 0 0

PORTRISHEAD (Somersetshire).—For the construction of about eight miles of sewers, sea-outfall, engine-house, cottages, and the supply and erection of gas-engines, air-compressing machinery, &c., Mr. T. J. Moss Flower, C.E., Engineer, Carlton Chambers, Bristol.
Contract No. 2.
Thomas & Webb £19,400 0 0
A. J. Beaman 18,900 0 0
G. Double 17,700 0 0
K. Neal 16,628 0 0
Lynton & Co. £15,661 3 0
J. & T. Bann 14,431 0 0
G. H. Wilkins, Bristol 13,800 0 0
* Accepted subject to modifications.

Contract No. 3.—Ventilating Chimneys.
Contract No. 3.—Ventilating Chimneys.
Per Ton.
Clay Cross Co. £12 10 0
Cochrane & Co. 12 10 0
Exrs. of Chas. Jordan 6 10 0
Stanton Iron Co. 5 17 0
Stewart & Co. (special) 5 11 0
Stewart & Co. (special) 5 4 0
J. Spittle £5 0 0
Macfarlane, Strang, & Co. 5 3 0
J. & S. Roberts, West Bromwich 4 17 0
* Accepted.

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Inlet. Outlet.
S. d. S. d.
W. Barter, London 23 6 13 6
Hind, Thompson, & Co., London 13 6 13 6
J. E. Filson, Leeds 13 6 13 6
J. Gibbs, Liverpool 13 6 13 6
Macfarlane Iron Co. 13 6 13 6
W. Larder (wire global) 13 6 13 6
* Accepted.

PORTLAND.—For the supply of broken granite for one year, Mr. E. J. Lifford, surveyor, General Stores, Port land.
Broken Granite.
S. d. S. d.
John Mowlem & Co., Grosvenor Wharf, Westminster, S.W. 11 0 11 0
W. H. Griffiths 10 4 10 4
Wm. Mair & Co. 10 5 10 11
K. C. Fennings 13 0 11 6
* Accepted.

SOUTHEND-ON-SEA.—For the execution of street works, St Vincent's road and others, for the Corporation, Mr. H. Harlock, Borough Surveyor, Clarence-road, Southend.
St. Vincent's. Hamlet-road. Printwell-path.
S. d. S. d. S. d.
Geo. Wilson 750 0 0
Holman & Co. 617 0 0
W. Griffiths 709 0 0
Fry Bros. 813 6 5
J. Jackson 618 0 0
E. Hles 614 0 0
127 12 10
103 10 0
217 0 0
359 8 12
319 0 0
367 0 0
254 13 0
157 0 0
300 0 0
361 12 2
356 0 0
347 0 0

SPALDING (Lincs.).—For the erection of office and shop in the Sheep-market, for Mr. Banks, Mr. Wm. Jepson, architect, 11, St. Thomas's road, Spalding.
William Leveley £565 10 0
J. W. Perkins 557 10 0
* Accepted.
(All of Spalding).

STAINLAND (Yorks.).—Accepted for alterations, &c., to Providence Independent Chapel, Mr. B. Stocks, architect, St. Peter's-street, Huddersfield. Quantities by architect.
Excavating and Masonry.—John Hollowell, Stainland.
Plumbing and Glazing.—S. & W. H. Jagger, Elland.
Painting.—S. Collett & Son, Stainland.
Lunn, Hagh, & Shaw, Huddersfield.

WINTERBOURNE STEEPLETON (Dorset).—For the erection of school buildings, Mr. A. T. Giffith, architect, Great Malvern. Quantities supplied.
W. Fry & Son £771 3 0
H. T. Ansus 533 12 0
Playgrounds and 1st & 2nd Fences
£80 10 12

WORKSHOP.—For the execution of new street works, for Mr. Wm. Peck, Mr. John Allport, C.E., Workshop.
C. Hett & Sons £500 0 0
R. & A. Newton 499 0 0
J. A. Nalden 491 18 7
J. H. Vickers 459 10 9
* Accepted.
(Architect's estimate, £421).

WOODFORD WELLS (Essex).—For the erection of fourteen cottages and repairs to eight others, for the Bow Brewery Co., Mr. A. S. Green, architect, 45, Seven Sisters-road, South Tottenham.
Simpson & Cove £4 45 1
S. Goodall 459 10 0
Green & Smith (accepted) 428 10 0

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VOL. LXIX. NO. 2735.

AUGUST 3, 1895.

ILLUSTRATIONS.

The Staircase, Ashburnham House, Westminster.—Drawn by Mr. E. W. M. Wonnacott, A.R.I.B.A.	Double-Page Photo-Litho.
"Norman's Wood," Surrey.—Mr. Percy G. Stone, F.R.I.B.A., Architect	Double-Page Ink-Photo.
"St. Margaret's," Mount Park, Harrow.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.	Double-Page Ink-Photo.
Selected Design for the Fox Almshouses, Norton, Durham.—Messrs. Clark & Moscrop, Architects.	Double-Page Ink-Photo.

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Derbyshire Marbles.



HE limestones of the Carboniferous series of Derbyshire have been noted for many years as producing most excellent marbles, but it is a long time since the varieties of stone found have been

described, and very little appears to be known concerning those actually polished and sent to the market. The following remarks are the result of investigation on the spot.

We found that a large number of the quarries alluded to by writers on English marbles, together with the kinds of marbles raised in them, are no longer to be seen, and in their places new quarries and stones have sprung up, which, so far as we are aware, have not previously been noticed. It is now 150 years since machinery for cutting marble was erected in Derbyshire, and that was at the picturesque village of Ashford, about two miles north-west of Bakewell. The works are still in a flourishing condition, and contain some of the most curious and interesting devices for polishing stone that we have ever seen. One of these, in particular, attracted our attention; it was an antiquated two-armed rubber, the shafts of which were attached to an oscillating pulk of timber—cumbersome, slow, and creaking, but doing its work very well for all that. Alongside this relic of the past, as if to challenge competition with it, stood modern machinery, well up to date, the whole being driven by water-power.

The marble polished in these works is raised in quarries far and near. Close by, on the other side of the little stream, is a quarry yielding "black" marble, wherein the beds of stone run up to the thickness of a foot or so. This material well deserves its name, for it is as black as jet, though here and there minute white spots may be detected in it. It may be described as a thin-bedded, earthy, bituminous limestone, having a conchoidal fracture. Small lenticular patches of black chert occur on certain horizons, which, of course, have to be avoided in sawing. The majority of the beds are separated by a thin parting of black shale. Chemically, the stone contains about 18 per

cent. of alumina, 4 of silica, and 1.5 of iron, the remainder being carbonate of lime.

Not far off, near the little village of Sheldon, is the working whence the famous "rosewood" marble comes. This stone is of a dark sienna colour with numerous thin lighter-tinted lineations running through it. These latter are undulating and even contorted in places, so that in producing a plane polished surface a remarkable pattern is revealed, not unlike that exhibited by polished rosewood. The maximum thickness of a bed is about 1 ft. 3 in.

In the neighbourhood of Sheldon, Sheldon Moor, and Monyash there are several quarries in what is known locally as "grey fossil" marble. In London and elsewhere it is variously styled "entrochal," and "encrinital," and we blush to read in the guide to a well-known London museum—a museum under Government control—issued for the information of the public, that this marble derives its names "from the presence of abundant fossil remains of *encrinites*," or "stone lilies." Then an "encrinite" is described—such a description as the older naturalists at the commencement of the century delighted in; and the architectural visitor, to whom that part of the guide referring to marbles would be specially attractive, is calmly asked to believe that the *upper part of the skeleton* (whatever that may mean in this sense) of one species of *encrinite* consisted of nearly 27,000 small bones. It is as well to remind the officials of the museum that science must not be caricatured in that fashion in an endeavour to popularise it, if indeed such is the aim—and the charitably disposed would probably regard the observations in that light. For ourselves, we know not what to think of the palæontological acquirements of the writers of that work when we read a little lower down the page that the "shell" marbles of Derbyshire contain the remains of *brachiopodous molluscs*, and that "The Spirifer and Producta, two genera of the above class, are the most abundant in these limestones." If it became necessary to mention the brachiopoda by name at all, why not have designated them correctly as *Spirifera* and *Productus*? And we have yet to learn that these are molluscs. The snatchings from the Greek, in the same paragraph, are

* The italics are ours, as in other words of the paragraph.—Ed.

strangely incongruous with such pseudo-scientific utterances, and serve to show that the intention was not altogether to popularise.

After this little digression concerning the shortcomings of those who should be our teachers in matters pertaining to the natural history of the marbles under review, it will not be unprofitable to say something respecting the various names by which these Derbyshire marbles are known to architects. We find that the terms "encrinital," "encrinoidal," "entrochal," "crinoidal," and "grey fossil" are commonly believed in the profession to be employed by scientists for reasons of their own, in alluding to these stones. Therefore, it is argued, we may call them by all or any of these names. But that is not the case, except in a very limited sense. The fact is that geologists, as a body, take no interest in the spread of knowledge concerning the applications of their science, and do not care one iota for Derbyshire marbles, as such, nor, indeed, for any other marbles, for the matter of that. A polished fossiliferous limestone is regarded by them as useful in giving glimpses into the structure of the fossils or of the stone as a whole. If the palæontologist could find a new crinoid genus, or a new brachiopod, by the aid of sections made in polishing the stone, he would feel thankful; and if the petrologist could by the same means throw some light on the origin of the crystalline matrix, or on the metamorphosis of the original organic remains into such fine calcite crystals with perfect cleavage as we see in the crinoid stems and calices, he would be delighted; but architects make a mistake in imagining that geologists are much acquainted with marbles, building stones, and the like, in the application of the materials. Things were different sixty years ago, but the spirit that was abroad when the Museum of Practical Geology was founded, is almost defunct at the present time—at least, so far as the scientists are concerned. Whatever names might have been given by the pseudo palæontologist to the Derbyshire marbles at the beginning of the century, and subsequently hashed up by the ubiquitous "natural historian" until they have assumed their present shape, it is not too late to inquire whether any of the appellations are founded on fact, and if so, which of them is the most appropriate. It is

absurd to use five or six different names for one material.

With reference to the term "encrinital," we may state that the genus *Encrinurus*, or more correctly *Encrinurus*, does not exist in the Carboniferous Limestone, nor, indeed, in any rocks of the Carboniferous system in this or in any other country; thus the marble ought not to be called "encrinital," even if on philological grounds such a word could be sustained. The same remarks apply to "encrinoidal," which, however, is still more a barbarism. As to the term "entochal," that, obviously, has reference to the wheel-like aspect of the crinoid stems when seen in transverse section, and is not altogether out of place. But when we observe that one definition of the word is "containing entochite" (*sic*) we are tempted to pass on, the more so that the vast majority of the markings do not in any way resemble a wheel in form. "Grey fossil" is not so bad until we reflect that ever so many different kinds of marble are "grey" and contain fossils; the term is not specific enough. Then, finally, we have to deal with "crinoidal"; this word is derived from the presence of the remains of crinoids in great abundance in the stone. It is unquestionably the most appropriate, only that a purist would possibly prefer "crinoid-marble," as being better compounded. And for the varieties we may adopt some such nomenclature as the following: "grey crinoid," "red crinoid," "coarse crinoid," and so on.

In reality the stone is made up of the debris of organic remains held together by a crystalline cement. Conspicuous amongst these are segments of the "stem" and other hard parts of the crinoid genus *Actinocrinus*, and its allies. The varying lengths and diameters of these segments, and the irregularity of their disposition (lying as they do in divers positions), constitute the chief features of the pattern of the marble. In producing the surface, the saws or moulding machines cut them in various directions, revealing elongated pieces in one part, and round spots and oval patches in others. These, together with countless numbers of smaller fragments of crinoids, derived for the most part from the breaking up of the "arms," are lighter in tint than the bulk of the crystalline cement alluded to, which may therefore be termed the background of the marble. The varieties of the stone as known in the market are largely determined by the colour of this background. In one it is a fairly uniform dark grey, in another a light brownish grey, whilst a third (not a very common variety) is similar to the last-mentioned, with the addition of a little pink, possibly iron, sparingly distributed throughout. The darker the background the more conspicuous the larger organic remains become. The "grey crinoid" marble is the most characteristic kind produced in the neighbourhood of Ashford and Bakewell, at which last-mentioned place there are also polishing works.

A variety known as "Russet" marble is quarried on Sheldon Moor. It differs primarily from the "grey crinoid" in that the organic remains are developed on a much smaller scale. Nevertheless they are chiefly those of crinoids. The background is about the same shade as that of the "grey fossil," except for the presence of a slight suspicion of brown in it.

Another kind, the "birdseye" marble, is a very fine-grained material of a deep but variegated brown tint with numerous white specks, the latter being chiefly the remains of crinoids. From the circumstance that the stems of these are frequently cut transversely, they appear as small round specks with a dark centre, in section—hence the fanciful representation of a bird's eye, from which the marble derives its name. It is raised in quarries near Sheldon.

The variety of the marbles polished in the Ashford area, to which we may lastly draw attention, is in some respects the most interesting of them all. It is the "coral" marble from Tideswell. Unfortunately, at

the time of our visit the quarry was closed, and had the appearance of having been so for a long time. When the stock of the stone at the polishing works is exhausted, we presume the quarry will be reopened, if it is not already, for it is unquestionably one of the best marbles in the county. Nothing could be more picturesque than the crag forming the outcrop of this band of the Carboniferous Limestone by the roadside. The rock is full of beautiful corals, and (though it does not augur well to say so from the point of view of durability), these being clearly weathered out stand in relief, like delicate carvings on the sombre background of the material. This, however, is a short distance from the quarry itself. The great variety of pattern in the marble is produced by the divers directions in which the conenchyma of each coral is cut; transverse sections show every stage from the earliest beginnings of the growth of the animal to the rim of the matured calyx, consequently the radiating septa, primary and secondary, are ever changing in size. By the development of synapical to a remarkable extent, many of the individuals present a net-like appearance, whilst the wall and epitheca of certain of them lead to the formation of a dark inner ring surrounded by a lighter one. Longitudinal sections of the corals also occur in infinite variety. It is very difficult to satisfactorily describe the colour of the marble. Regarded at the distance of a few feet, it is seen to be a dark brown with streaks and patches of a lighter tint. Regarded more closely, a somewhat opalescent appearance is defined in a few of the coral sections, whilst much of the background is a dull yellow.

It would serve no useful purpose to describe in detail the uses and misuses to which these marbles are put. The greatest part of them are manufactured into chimney-pieces, slabs, small pilasters, and the like. Broken fragments, &c., are made into mosaic work, which is an important industry in the district. It must not be imagined, however, that all the marble used in the mosaics, any more than that worked up into chimney-pieces, is raised in Derbyshire. Some of it is unquestionably Carrara and Sicilian. It may seem curious, but in that out-of-the-way village Ashford we saw marbles from China polished, which clearly shows the necessity for knowing what marbles are really raised in the county when we desire to have the genuine Derbyshire article. It is only right to mention, though, that the courteous proprietor did not in any way attempt to disguise the source of origin of the foreign marbles referred to.

Knowing how difficult it is to obtain clear information as to the size of blocks procurable, especially with reference to monolith columns of marble, we were at some pains to go into the matter. The following table gives particulars on these points:—

Ashford Marbles—Size of Blocks, &c.

Name of Marble.	Size of Blocks.	Size of Columns.	
		Length.	Diameter.
	ft. in. ft. in. ft. in. ft. in.	ft. in.	ft. in.
Black.....	0 3/4 x 6 0 x 5 0	6 0	0 9
Rosewood.....	2 6 x 2 6 x 1 0	2 6	1 6
Russet.....	10 6 x 5 0 x 1 6	10 0	1 6
Birdseye.....	8 0 x 2 0 x 5 0	8 0	2 0
Grey Fossil.....	10 0 x 5 0 x 0 9	10 0	0 9

At certain times thicker beds are met with than appear in the above table; the "grey fossil" (or "grey crinoid," as we prefer to call it) is especially liable to vary, but not to the extent of more than a few inches. From this we see that the commonest and best-known marble in the district occurs in very thin beds, suitable for slabs and the like, but not thick enough for large monolith columns. The "Birdseye" marble is better in that respect, though it only occurs up to 8 ft. in length. The "Rosewood" is found in small blocks; whilst the thinness of the Black marble precludes its use for many purposes which its general excellence otherwise fits it very well for.

Turning now to another district in Derbyshire, that of Hopton, in the vicinity of Wirksworth, we note that the marble industry is yet on a larger scale. We find it very difficult to appreciate the difference between the "marble" and the "stone" trade there, and a fine point is raised as to what constitutes a marble. If architects were asked whether the light grey stone from Hopton Wood, of which a great part of the interior of the Imperial Institute is built, was marble, the majority would answer in the negative. Yet it is polished, and so is the greater part of the Hopton stone sent far from the locality. Of course, in a strictly scientific sense, none of the stone we are speaking of is marble, that term being reserved for a crystalline limestone of metamorphic origin, such as that from Carrara. We are using the term marble as it is used by architects; and if polished limestone, like the bulk of that from Hopton, and which is generally known as "building-stone used for ornamental purposes," is not marble, then none of the other polished stones from the same locality, nor from Derbyshire generally, nor from Devonshire, have any right to be called marbles. The Hopton Wood building-stone in the market does not differ materially from the "Birdseye" marble previously described, nor, indeed, from the "Grey Birdseye" marble from Hopton itself, except in regard to colour, and in one or two minor points presently to be noted. Broadly speaking there are six varieties of stone worked in the neighbourhood, of which five are termed marbles and one building-stone; we shall call them all marbles. They are as follows:—(1) "Grey Fossil;" (2) "Red Fossil;" (3) "Grey Birdseye;" (4) "Black Birdseye;" (5) "Light Hopton" (building-stone); (6) "Dark Hopton."

We did not visit the whole of the quarries in the district. The following are examples of what we saw:—

Section at Coal Hills Marble Quarry, near Wirksworth. (Fig. 1.)

1. Rubble and made earth.....	ft. in.
2. "Bluish grey fossil" marble.....	1 6
3. "Red fossil" marble, with "grey fossil" in places.....	2 9
4. "Dark fossil" marble (best bed), mixed occasionally with "grey birdseye".....	8 0
5. "Light grey birdseye" marble.....	2 0
6. "Dark.....	1 6
7. "Black birdseye" marble, in two beds, 1 ft. 6 in. and 1 ft. respectively.....	2 6

Blocks of practically any length may be obtained, but the above thicknesses appear to be the ordinary run of the material. The stone is drilled by hand only, and the average rate of penetration, with two men striking the drill, is 5 ft. in two hours, for a hole 1 1/2 in. diameter. The refuse from the quarry is used principally in the manufacture of tar paving. The material is put through a crushing-machine driven by a 10-horse-power engine, capacity 200 tons per week. Some of the stone is hand-broken, however.

A mile or two from this is an enormous working, which may be divided into two sections, one relating to a higher horizon in the Carboniferous beds than the other, whilst the particulars were obtained at two different spots.

Sections at Middleton Wood Quarry, Hopton Wood.

A.—Upper working:—		ft. in.
1. Clay and rubble.....	3 0	
2. Rubble.....	17 0	
3. Thin parting of clay.....	0 1	
4. "Dark Hopton" marble.....	9 0	
5. This occurs in six beds; when sound it is used and called "Light Hopton" stone.....	30 0	
6. "Old white" bed, largely exploited.....	14 0	
B.—Lower working:—		
7. White stone, mostly used for kerbs and setts, in several beds.....	20 0	
8. Clay in two beds with partings of stone. It varies from 2 ft. to several feet in thickness, say.....	5 0	
9. White stone, in several beds. The "best white" for polishing comes from this horizon.....	60 0	



Fig. 1.—View of portion of Coal Hill's Marble Quarry.



Fig. 2.—Marble saws and frames; also polisher (in the right foreground of the view).



Fig. 3.—Circular rotating marble rubbing table: lathe in the background.



Fig. 4.—Hopton Wood marble, finished and temporarily fitted at the works.

As will be gathered from the above, these are very large quarries, and employ over two hundred men. It is rather a contradiction in terms to say Middleton Wood quarry, Hopton Wood, because the quarries are not situated in the latter wood, but the former; the stone used to be quarried at the latter place. But the material is so well known as "Hopton Wood," which is only a very short distance away, on the opposite side of the valley, that we prefer to adhere to the older name.

Only the rough stone is blasted; good blocks are levered from the face of the workings by "plugs and feathers." Drilling work is done by hand only, and the rate of penetration, two men striking, is about 5 ft. per hour for a hole of 1½ in. diameter. The stamping used is clay and small pieces of stone. The material does not split very easily, though the grain is tolerably uniform. The system of haulage from point to point along the face of the workings, to the polishing sheds, and finally to the railway, is rather elaborate, and is practically unique so far as this country is concerned; but we need not go into that matter now.

The machinery at the masons' dépôt attached to these quarries may be summarised as follows:—In addition to the usual complement of gantrys, and lifting gear generally, there are several frames for sawing the marble blocks into slabs (fig. 2); rubbing tables revolving on spindles, and made of iron, one of which is 13 ft. in

diameter, and another 6 ft.; the stone is rubbed preparatory to being polished by being weighted and then placed on the revolving table (thirty-two revolutions per minute), from the centre of which to the circumference beams of wood are fixed at intervals, against which the stone rests whilst the table moves round underneath it (fig. 3); a polishing bed (fig. 2); and three stone lathes, one of which takes columns up to 16 ft. in length, and as much as 3½ tons in weight, the whole being driven by a powerful steam-engine.

All moulding work is polished by hand, on which account there seems to be room for improvement. When several stones are employed for one moulding, or for pilasters, they are fixed in plaster of Paris side by side and all polished together so that the surfaces shall run evenly. The white stone is used for practically all architectural purposes, polished and unpolished, and for the construction of monuments, whilst certain varieties are worked up for kerbs, setts, and pavements; for inside work it is often fixed as "diamond paving." We noted that where a column, or moulding, consisted of several pieces of stone, the polish revealed the fact that they were frequently variable in tint, a light-coloured stone sometimes being sandwiched between two rather darker ones, and *vice versa* (fig. 4). This may or may not be detrimental to the material from the point of view of its appearance, depending on taste; in any case we imagine that

the manufacturers could easily so arrange matters that this did not occur, by judicious selection of the blocks. It is next to impossible, however, to tell the precise tint (to within a slight degree of shade) that will be assumed by a rough block of stone on its being polished, and great experience is demanded to estimate the tint even approximately. The polish also indicates that the tint is variable in one and the same block, and some blocks present quite a piebald appearance; this, of course, was not so noticeable in the stone when not used as marble. Other than this we have nothing but praise for the material, as a marble, especially for interior decoration. The stone must be durable and is very suitable, in the unpolished condition, for outdoor work—that is, the light Hopton stone. The material is not in any sense a freestone, it is too hard and crystalline for that. Its general behaviour when used on a large scale can nowhere be better judged than in the Imperial Institute, though it will be found in numerous other public and in private buildings.

The sawing done in this stone-yard was accomplished with "grit-sand" from Matlock and the River Trent. Judging from what we saw, the work could be performed much more rapidly, and quite as efficiently, by the employment of chilled shot, which, however, would have to be of very fine grain; but we merely throw this out as a suggestion. The manager is an extremely competent engineer, and doubtless understands the material

much better than we do. Chilled shot has been strongly objected to in the few small marble-polishing establishments in England that have come under our observation, where it has been tried, but we are not convinced that the objections raised were valid. As a rule we find that the shot has not been properly used, the chief complaint being that stray shots will find their way under the rubber or polisher, and scratch the surface of the all-but-finished work. This points to carelessness, for quartzose fragments of sand used in the sawing might, to use the same reasoning, be placed in the same circumstances, and do the same amount of damage. Anyhow, they manage these things a little better in two or three marble-converting establishments we recently visited on the continent. Want of space might be urged with small works, but with those of such magnitude as at Hopton we feel sure that the chilled shot could be economically employed. That must be largely a matter of experience, however. After being sanded, the Hopton marbles are treated with No. 1 emery flour, and the polish is finally brought out by the application of putty-powder.

The varieties of marble raised in the vicinity of Wirksworth have already been alluded to by name. Commencing with the "grey fossil" raised at Coal Hills quarry (fig 1), we may say that it does not differ materially from the stone of the same name coming from Ashford, with the exception that it is slightly warmer in tint, containing some yellowish-brown colouring matter; as before, we should call it "grey crinoid" marble. The "red fossil," also, is of a brighter colour, and deserves the name "red," this colour pervading not only the crystalline background, but the darker portions of the crinoid fragments—it is a handsome marble, also from the Coal Hills quarry. The same working yields the "grey birds-eye," a stone of brownish tint made up of myriads of small fragments of crinoids. It differs from the "black birds-eye," apart from its tint, in that the latter has more comminuted shelly material. The last-mentioned marble is blacker than the "birds-eye" from Ashford, whilst the light-coloured specks are smaller. The "dark Hopton" marble is composed of pieces of the tests of brachiopods and small crinoid fragments in about equal proportions, bound together by a crystalline cement of calcite. It differs from all other Derbyshire marbles mentioned, in that the larger fossil remains are of a darker tint than the matrix in which they are set; the whole is a light brown colour. The "light Hopton" marble and "building stone" is similar to the stone lastly described, only that in general the fossil remains are very much smaller (though larger fragments occur here and there) and the material is lighter in tint. In ornamental inlaid work from the Hopton Wood quarries one sometimes sees onyx-looking pieces of stone employed; these are polished stalactites, stalagmites, or pieces of vein stuff found, as aragonite, in the workings; the supply is very limited.

The following are particulars concerning some physical properties, &c., of the materials under review:—

Strength of Hopton Stone.

Middlepeak stone crushed at 811½ tons per sq. ft.
Hopton building stone " " 444½ " "
"Birdseye" marble " " 812½ " "

From these figures it will be gathered that all the stones are much stronger than ordinary limestone freestones.

Weight and Absorptive Properties of Hopton Stone.

Description of building-stone.	Weight per cubic foot.			Water absorbed per cubic foot, 30 hours' immersion.
	Dry.	Wet.	As quarried.	
	lbs.	lbs.	lbs.	Pints.
Hard Bed	168½	169½	168½	2½
Dark Bed	155½	158½	156½	2½
New Hopton	159½	161½	160½	1½

Neither of the materials can, therefore, be said to be very absorptive, though the dark

bed stone imbibes rather more than is good for it. The amount of quarry-water present is less than usual in such stones.

Chemical Composition of Hopton Stone.

Lime	55.30	55.10
Carbonic acid	43.60	43.61
Silica	0.75	0.14
Magnesia	0.45	0.27
Oxide of iron and alumina	0.25	0.25
Phosphorus	trace	trace
Sulphur	trace	trace
Moisture	0.10	0.02
Organic matter	—	0.06
Totals	100.45	99.78

The two analyses were made just within three years of each other, and refer to the white Hopton stone. It will be noticed that the results are closely concordant, a circumstance which seems to indicate that the material is very uniform in character, inasmuch as the face of the stone having been worked into for three years no appreciable difference in chemical composition was observed. The analyses indicate also that the limestone is excellent from a metallurgical point of view; it makes a good flux to iron and steel smelter owing to its almost entire freedom from phosphorus and sulphur.

The only other marbles raised in Derbyshire of any note, are the alabasters and the fluor spar, the latter being best known, perhaps, as "blue John"—if either of these can be called marbles. The alabaster of Chellaston Hill is known in the district as "Derbyshire spar," and is principally used in the manufacture of small ornaments, vases, and the like. It is white, with light yellow and red veins, and is very soft.

On the whole, we were rather surprised to find the marble industry of Derbyshire so large as it is; in common with others, we were under the impression that it was practically a dead letter, excepting, of course, the Hopton stone district. The marbles have much to commend themselves. We do not care for the "grey crinoid," though, as before mentioned, this is very extensively made up into mantelpieces, small pilasters, &c.; the pattern is not good, the large white crinoid stems are too obtrusive. But the finer-grained marbles, all of them of subdued tints, and especially the "dark birds-eye," are handsome decorative materials, whilst the "black" marble is one of very few similar stones exploited in this country; it is unfortunate that it does not exist in thicker beds.

THE PROPOSED NEW VAUXHALL BRIDGE.

SINCE last week we have received some further information in regard to the Institute of Architects' design for the new Vauxhall Bridge than was indicated in the *Journal of Proceedings*, though the actual design is in the hands of the Bridges Committee of the London County Council, and is kept, technically at least, a private matter. But we now feel no doubt that the bridge as proposed by the Institute Committee would be a far better thing than there is the least chance of it becoming if carried out as proposed by the Engineer of the County Council. The proposed widening of the piers to 17 ft., as against the 12 ft. proposed by the engineers, is in itself a very important step in the direction of giving a monumental character to the construction, and there is no practical reason whatever against it; that is to say, the difference it will make in the waterway will be of no practical importance. The idea of the Institute designers is that no ironwork should be carried past the piers, but all stopped against them; and the corbelling out of the foot-walk was, it appears, devised partly with the object of giving a greater effect to the mass of the piers, against which the footway would be stopped, leaving the main portion of the girders set back and in shadow. This, we admit, would be very effective, though we still think that the design of the present balustrade, which it is proposed to reproduce with some trifling modifications, and which

may be said to consist of cast-iron treated architecturally, will not look the same thin, when placed on a corbelled out footway as it does when forming, as now, the finish to the main construction. With this exception, however, the proposed treatment of the bridge would be as good as can well be obtained under the compulsion to adopt steel and not masonry for the arches. The spandril ties it is proposed to show nearly as they are constructed, a upright ties, in somewhat the same manner as in the present bridge. A good deal of trouble has been taken over the design of the stone piers, which would be satisfactory in effect and somewhat original, without losing breadth and simplicity. By the adoption of this design there is a chance for London to have a new bridge of good architectural character, as far as this can be achieved under the imposed conditions of using steel arches.

As to the design proposed by the engineers, if one may judge from an illustration of it which seems to have been surreptitiously communicated to a daily paper some time since (for the Committee, or the engineers, are guarding it most jealously from inspection), it would be, if erected, one of the very worst, in an artistic sense, of all the London bridges, marked by all the tawdry would-be architectural gimcrack of Blackfriars Bridge. The County Council engineers, it is understood, are violently opposed to any interference with their design, and determined to carry it out if possible in the teeth of all opposition. This is the usual attitude of engineers in such matters, arising naturally from the fact that they never study design in an architectural sense, have not the slightest idea what it means, consequently do not understand the meaning of the disgust excited in the minds of artists by their work, and probably imagine that it is a mere piece of interference on the part of architects who want to put themselves forward. As a matter of fact, in the present case the Institute of Architects were directly invited by the Bridges Committee to submit a design of their own, and therefore any accusation of interference on their part, from the engineers, is absurd.

We believe there are members of the Bridges Committee who are fully alive to the desirability of securing a fine bridge for London on this opportunity, and it is to be hoped that they will stand firm, and be deaf to the objections of the engineering department, which are merely the result of a dislike to be interfered with by architects. The design of the bridges over the Thames is a very important element in the architectural aspect of London, and it is really monstrous that we are to be compelled to have a vulgar and tawdry erection thrust upon us, merely because engineers know of nothing better, and cannot understand why any one wants anything better. Let engineers learn a little about design in the architectural sense; or if they cannot or will not do that, let them at least be a little more modest and a little more ready to give way on a matter on which they are not competent to form an opinion.

NOTES.

THE article in the current number of the *Quarterly Review*, on "Londoners at Home," contains a good many truths trenchantly expressed, more especially in regard to social conditions. But the whole article is much vitiated by an overacted pessimism, which seems to include an entire forgetfulness of the immense improvements in sanitation and construction which have been made during the last half-century. It is stated that London houses and the dwellers in them were much more clean and cleanly sixty years ago than now. How can such an assertion be maintained when we know that at the time mentioned such a thing as a bath-room was unknown in an

ordinary London house? The article urges that people should do their clothes washing at home. Why? And where are most of them to do it? The establishment of large wash-houses and laundries has been of the greatest advantage, both to the comfort of London houses and to thoroughness of cleansing. The suggestion that the children in Board Schools should be made to clean their own schools, as sailors clean their own ships, has something in it, perhaps, as providing a useful training in the art of keeping houses clean. A suggestion that much illness in London arises from the extremes of heat and cold, in summer and winter, in attic sleeping-rooms, is probably true, but to say that more ill-health arises from this cause than from defective drainage is absurd. Where drainage is defective, people are certain to suffer in health from it, the strong and the weak alike; but it by no means follows that all sleepers in attics suffer in health. The article is one which is worth attention, but as a comparative picture of London now and half-a-century ago it is most unfair, and entirely ignores a progress in sanitary measures which has been one of the most remarkable characteristics of the latter part of this century in England, and in London more especially.

WE have received a copy of "A Form of Agreement and Schedule of Conditions for Building Contracts," dated July, 1895, which is published by, and with the sanction of, the Royal Institute of British Architects, and which supersedes "The Heads of Conditions of Builders' Contracts," dated 1882. The conditions are intended for use where the quantities do not form part of the contract, and they practically comprise the whole of the old conditions in a revised and amplified form. The wording is more explicit, and the terms of some of the conditions are less arbitrary in their provisions than hitherto. The additions that have been made include the definition of the Clerk of the Works, as inspector under the architect, the definition of the term "prime cost," and a suggested mode of treating the provisional sums in a contract. Reference is also made in various clauses, to access to workshops or other places where work comprised in the contract is being executed, to the question of extras comprised in architects' details or instructions, the ownership of materials not fixed, the defects in sub-contractors' work, the uncovering of work for inspection, and the allocation of its cost. The following clause will be interesting to quantity surveyors, and supplies a need:—"The fees for the bill of quantities and the surveyor's expenses (if any) stated therein shall be paid by the contractor to the surveyor named therein out of and immediately after receiving the amount of the certificate or certificates in which they shall be included."

... If the contractor fails or neglects to pay as herein provided, then the employer shall be at liberty, and is hereby authorised, to do so on the certificate of the architect, and the amount so paid by the employer shall be deducted from the amount otherwise due to the contractor." The conditions have undoubtedly been much improved, and may now be considered up-to-date. The majority of the alterations have, however, become quite familiar to most of our readers in the well-written specifications of present-day practice.

WE have received also from the Institute the new papers for the four series of Examinations, for passing respectively as Probationers, Students, Associates, and the special examination for those who wish to pass as Associates, and who are in a position to be exempted from the Probationers' and Students' Examinations, and from sending in "Testimonies of Study." Such applicants can be admitted (by resolution of the Council in each case) to a qualifying examination, on the lines of the Final or No. 3 Examination, but conducted with especial regard to the requirements of such applicants, their

professional work and position being duly taken into account by the Board of Examiners. The distinction, however, between the "Final" and "Special" examinations appears to be only in the form of application and the nature of the "Testimonies of Study," which in the case of the special applicant must consist of the working drawings of any building erected from his design and under his superintendence, together with a drawing of a building in perspective, and a sheet of ornament drawn from the round. These two latter might be questioned, seeing that a man may be able to carry out a very good building without being able to make a good perspective drawing of it, and may be able to model ornament well without being able to draw it so well. It might have been well to give the option of sending a model or a drawing of ornament. That every architect should understand perspective is no doubt most important, but his drawing in such a case should be judged by the knowledge of perspective evinced, and not by its mere effectiveness as a drawing. Generally speaking, the points for examination in the three stages are very well grouped and selected, and form a valuable outline for the course of study of a young architect. They will not, as everyone knows, make a man an artist in architecture, but the passing of them will ensure that he understands a field of work in which there is a great deal to be taken account of besides artistic design.

THE first penalty under the Rivers Pollution Act has at length been inflicted, and not a day too soon. Nineteen months ago an order of the Court was obtained by the Ribble Joint Committee requiring the Accrington and Church Outfall Sewerage Board to carry out an efficient scheme of sewage-purification within eighteen months. The members of the Board have thought about the matter, and have even made experiments, but they have taken care not to spend any money on a practical scheme. As one of the members naively said, "While we are experimenting we are delaying, and that is what we want." Exactly; but the judge did not take quite such a light-hearted view of the matter. He inflicted a penalty of 10*l.* a day for the twenty-eight days beyond the stipulated time—that is to say, 280*l.* in all—with costs on the higher scale. Surely the Mersey and Irwell Joint Committee can obtain similar convictions against the authorities which have converted the Manchester and Salford Docks into stinking cesspools.

WHEN the case of Wright v. Hennessey came before a Divisional Court of the Queen's Bench Division on an application for an injunction, we pointed out that the most important decision would be that given in the final trial. That trial has now taken place, and a report of it is given in another part of this journal. It seems to set at rest any question as to the right of anyone acting on behalf of a trades union to endeavour to carry out the objects of such union by injuring an employer of labour. The jury found that the letters written by Mr. Hennessey, the organising secretary to the National Association of Operative Plasterers, in respect to the plaintiff, who was a master plasterer, were written with the intention of injuring him. The jury also found in the plaintiff's favour on the allegation that the defendant had endeavoured to induce persons to break their contracts with the plaintiff, and they gave in all 800*l.* damages. As a matter of fact the aggressive power of trades unions lies in the ability to injure individual employers. This case will probably aid materially in putting an end to such tyranny. Aggressive action, such as gave rise to this litigation, is quite foreign to the true aims of a trades union, which should be protective and not aggressive. There was no more withdrawal of plasterers from the plaintiff's employment, but it was the defendant's intention, to use his words, that

"Wright should go," that is, not be allowed to take any contracts. We may observe, also, that it seems doubtful if the defendant, even from his own point of view, had correctly ascertained the facts on which he founded his view of the plaintiff's so called misconduct or unfairness.

THE letter in Saturday's *Times* by Mr. George Forbes, the Engineer to the Niagara Cataract Construction Corporation, shows at any rate that some electrical engineers are not troubled with any mock modesty. Mr. Forbes may have no hesitation in saying "that the low cost and perfect success, practically and commercially, of the Niagara Works opens a new era in the world's 'industrial evolution';" but, even granting his assumption, we think that the new era began some ten years ago, when the alternating dynamo began to take its modern form and work with its present high efficiency. We all know that Mr. Forbes was one of the pioneers of electric lighting, but he is taking too much credit to himself for the Niagara Works. The engineers of the Cataract Construction Company went round to different constructors in Europe seeking for information. The company had also the advice of the best electricians in Europe and America, Lord Kelvin and Professor Rowland amongst others. It is true that they did not take the advice of Lord Kelvin, and we have Mr. Forbes' word for it that they did not take Professor Rowlands', but it does not at all follow that if they had, the enterprise would have been a failure. The tender sent in by Messrs. Siemens' Brothers for constructing the works at Niagara proposed to supply continuous current. Mr. Alexander Siemens, who is a very great authority on power transmission, says that he has always found continuous current the best. Mr. Forbes in his letter accuses Lord Kelvin of predicting failure to his system. This brought a disclaimer from Lord Kelvin in Tuesday's *Times*, and a reiteration of the charge by Mr. Forbes in Wednesday's *Times*. Anyone who knows Lord Kelvin's views is aware that he regards continuous current as the best solution, but it is impossible to believe that he would predict the failure of an alternating current system of supply, seeing that he has been, and is, consulting engineer to so many successful alternating current supply stations. Professor Silvanus Thompson's letter in Thursday's *Times* is beside the point, for it is too soon to refer to Niagara as being a crushing argument in favour of alternating *versus* continuous current supply.

AT the recent meeting of the Archaeological Institute in Yorkshire an interesting point turned up, in the discovery at Lastingham Church of some portions of the boarded centering used by the Norman builders in the construction of the crypt (1078-1088). Mr. John Bilson, in the course of his description of the church, drew attention to these pieces of boarding, and the fragments were examined by Mr. J. T. Micklethwaite, Mr. W. H. St. John Hope, and Mr. C. E. Ponting, who all agreed that these bits of boarding were really parts of the original centering. This part of the crypt is vaulted in nearly square compartments, with an unribbed groined vault upon unmoulded cross arches. The ends of the centering-boards rested upon the extrados of the arches, and the mortar used in constructing the groining had run between the joints of the boarding, and so fixed it to the soffit of the vault, where several fragments still remain. The point is the more interesting as another proof of the unfinished condition of this fragment of a monastic church, when Stephen or Whithy and his monks left Lastingham to found the Abbey of St. Mary, York (c. 1088).

ON Friday, last week, there was a meeting at the monument to Captain Cook on Easby Hill, Great Ayton (on the Cleveland



Yarrow Home for Convalescent Children, Broadstairs. Messrs. Davis & Emanuel, Architects.

but simple gatehouse, later in date, probably, than the house itself. Forming the third side of the quadrangle (the moat forming the fourth) is the small church, with an interesting bell-turret at the west end, and a good stone rood-screen ornamented with shields charged with the arms of the Trapnells, builders of the house. The whole of the interior of the house has been much subdivided in recent years by partitions, and the hall has been divided into two stories by a floor. We gave a view of the house and church in the *Builder*, August 20, 1887, and full plans and elevations and details will be found in the third volume of Pugin's "Examples," and also of the neighbouring house at South Wraxall.

Bradford bears all the marks of having been for some time a flourishing town. Many of the houses are of architectural importance, there being more than one of the Georgian period well worth noting. There are two earlier examples with carved bargeboards in the centre of the town. Two churches, the parish church and the Saxon church north of it, were seen, and also the bridge, with its little chapel (a simple example of the type of bridge chapel still remaining at Kotherham and Wakefield and St. Ives),* a picturesque row of almshouses south of the bridge, and a fine fourteenth-century barn, with a double entrance, as at Douling, and a very good roof.

Two miles distant is Westwood, a small village on the top of a hill, with an interesting manor-house and church. Of the manor-house we give an exterior view as seen from the churchyard. It is an L-shaped house, facing south and east. The south wing is the oldest portion of the house, and has a most picturesque series of windows, the oriel at the one end and the bay windows at the other making a charming variety. The east wing is a little later, with a gabled porch. Inside are one or two good plaster ceilings. The church, although small, is a good example of Perpendicular work, the chief point on the exterior being the fine western tower, with its pannelled belfry stage and angle stair turret. In the interior is some interesting glass, and a Jacobean pulpit. At the east end of the north aisle, on either side of the east window, are niches with their colouring still visible.

From Westwood a fine drive through wooded scenery brought the party back into Somerset, the next and last place to be visited being Hinton Charterhouse, one of the few Carthusian houses in England, in this case founded by Ella, Countess of Salisbury, who married William Longspée, son of Henry II. Of the other houses of the order Mount Grace, in Yorkshire, and Witham in Somerset, are the most important. At the former, the complete arrangement peculiar to the Carthusian order, of the separate cells or chambers for each monk, still remains, but at Witham only the church remains,† much restored, and the site of the conventual buildings. At Hinton some very interesting buildings, still roofed, are standing, and although it is difficult

without excavation to determine the exact arrangement of the buildings, there seems little doubt but that the eastern of the two principal blocks formed the slype sacristy, and Chapter-house of the monastery. Against the north wall are the remains of the vaulting-shaft attached to the church, and foundations of the church itself, with apparently a semi-circular eastern termination, had been found. A penitence ran along the west face of the Chapter-house and slype. About 105 ft. west of the Chapter-house is another building vaulted, in two chambers one, the smaller, with a large fireplace, and communicating with the large room by a doorway at one end, and a "hatch" at the other. At the east end of this building are three arches, two now blocked, showing that it was connected on that side with a building now destroyed. Along the south of this building is also a penitence, and westward are traces of a thick wall. Although the life of the Carthusian monk was spent chiefly in his cell, they met on special occasions in a refectory, and it is possible that this building is the refectory, with kitchen attached on the east side, and forming the north side with buildings now destroyed of the inner court, which was kept for the monastic use, entry being denied to strangers. North of the church would probably have been the outer court, with the guest-house and gatehouse, and the "Abbey House," now a dwelling, although of Elizabethan date, may very well occupy the site of some of these buildings, and have more ancient work incorporated. On the return drive the interesting terraces—all that remains of the old manor-house of Claverton—were passed, being the last item in a most interesting excursion.

On the third day, Thursday, the excursion was to Lansdown, St. Lawrence's Chapel (a fifteenth-century chapel with house attached, now a farm), the site of the battlefield, and to the village and town of Cold Ashton and Marshfield. At Cold Ashton is an interesting house of Elizabethan date, very complete, with much woodwork, plaster ceilings, and a curious pantry or lobby of wood between the "hall" and the kitchen, and occupying the space on the kitchen side of the "screens." The church, a Late Perpendicular building, erected by a rector, Thomas Keys, is interesting, possessing a pulpit of stone, projecting from the north wall of the nave, and approached by a stair which also led to the rood-loft. A similar instance is at Nailsea in Somerset. On the labels of the windows and the porch door, the terminations have the "rebus" of Thomas Keys, a T with a key interlaced. At the parsonage Sir Bevil Grenville died, after the battle of Lansdown, in 1643.

Marshfield has many interesting stone houses in its street, a good row of almshouses, dating from the beginning of the seventeenth century, with chapel in the centre, a church of Decorated and Perpendicular date, and the remains of an Elizabethan manor house, with late additions. To the north of it is a good barn.

The party here divided, some returning to Bath direct, others going to Claverton to accept the hospitality of the President.

YARROW HOME FOR CONVALESCENT CHILDREN.

On Wednesday last, the Yarrow Home, at Broadstairs, was opened by the founder, Mr. A. F. Yarrow, in the presence of a large gathering of interested persons, most of whom were conveyed from London by a special train. The objects of the Home may be briefly stated by saying that it is not intended for the children of the very poor, for whom provision is already made by means of existing charitable agencies, but is for the reception of children of deserving persons who are not in a position to supply to their convalescent children, entirely at their own cost, the advantage of a temporary residence at the seaside. Children, it is expected mostly from the professional class, are admitted between the age of four and twelve, irrespective of nationality and creed, and the parents are expected to pay 5s. a week towards maintenance.

The building is placed in grounds covering 10½ acres at the south side of Broadstairs, the site sloping considerably downward towards the sea. The general scheme of the design of the Home is a central administrative block, with wings for the girls and boys respectively, and accommodating fifty of each.

The lower ground-floor, facing the sea, and formed by the slope of the ground, contains the large dining-hall, 64 ft. by 27 ft., placed centrally, separate access for the boys and girls being given by means of the two staircases. On this floor are also the kitchens, servants' hall, store-rooms, &c. The boiler and heating apparatus, on the low-pressure system, are also on this floor. The ground-floor has the main entrance from the Ramsgate-road in the centre, the central block containing also the matron's room, nurses' sitting-room, committee-room and dispensary and secretary's room. The wings on either side contain on this floor large and small day-rooms, opening on to a verandah extending the whole length of the building; dormitory, with nurses' room adjoining; play corridor, 66 ft. by 10 ft., also serving as a communicating passage.

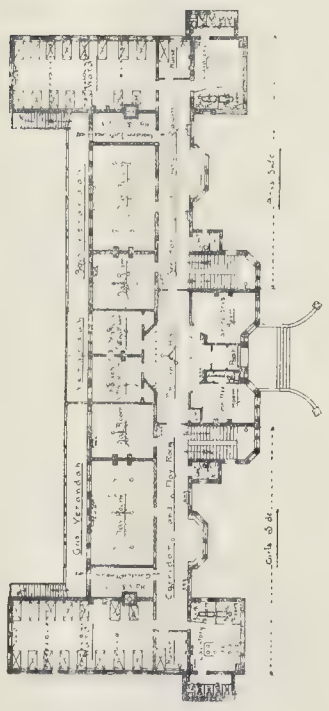
A staircase from the verandah leads to the covered playground.

The floors to dormitories are laid with pitch-pine in narrow widths.

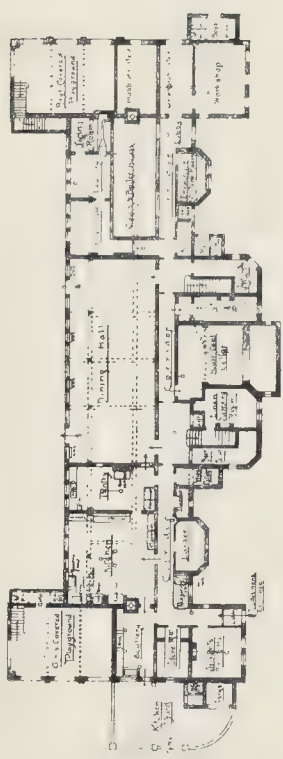
The first-floor, reached by a boys' and girls' staircase of teak, 4 ft. 6 in. wide, contains the matron's and nurses' bedrooms in the central block, and dormitories of different capacity on either side of the central wing. Each dormitory has a nurses' room adjoining, with inspection-window for supervision. The baths and lavatories are placed in the wings at each end of the building, as also the water-closets, the latter being disconnected from the former by means of windows for cross ventilation. The floor to the lavatories is of terrazzo mosaic paving. On account of the hardness of the water in this chalk district, a "Maignen's" water-softening apparatus is fixed over each of the lavatory blocks. In addition to the hot-water apparatus, the day-rooms and dormitories are fitted with hygienic ventilating grates and two exhaust shafts, to which the various horizontal air trunks in ceilings are connected, are

* See *Builder*, November 22, 1890.
† For plan see *Builder*, August 25, 1894.

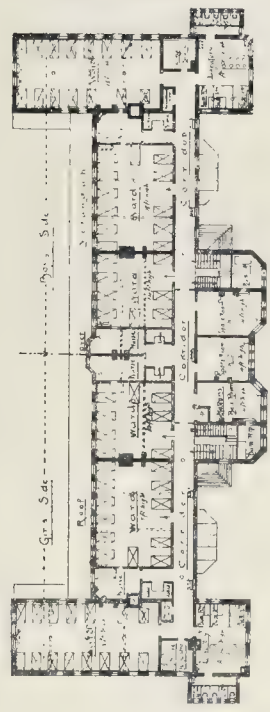
The Yarrow Home, Broadstairs.
[for Convalescent Children.]



Ground Plan
14 ft. high in clear



Basement Plan
14 ft. high in clear



First Floor Plan
14 ft. high in clear
About 4 ft. 6 in. high in clear

Second Floor Plan
14 ft. high in clear

Lowest level, the ground level, is 10 ft. 6 in. above sea level

vided, one at each end of the building, for
acting the vitiated air, the air in the several
ms being capable of being changed twice in
n hour.

Externally, the building is symmetrical, as has
been mentioned, the materials used being local
red bricks with Ancaster-stone dressings, the
steep roofs being covered with Broseley tiles, the
verandah being constructed in wood. The land-
scape gardening has been effected largely by the
employment of the excavated earth, and in
forming a mound on which a look-out summer-

house has been erected, which commands a splendid view of the surrounding scenery. The objects for which the building is intended are unique, and the erection and endowment of such a scheme deserve hearty recognition. The architects are Messrs. Davis & Emanuel, and the contractors Messrs. Colls & Sons, of London.

Illustrations.

STAIRCASE, ASHBURNHAM HOUSE.

STANDING along the north side of Little Dean's-yard, and formerly styled "the Dean's House," Ashburnham House occupies the site of a residence that had been constructed with the remains of the old Miseri-corde for Abbot Benson (called Boston from his birthplace), who lived there, as first dean, 1539-49, during which interval Bishop Thirlby occupied the abbot's house, now the deanery. To Benson in the "Dean's House" succeeded Deans Cox, Weston, Bill, and, for a while, Goodman. It is commonly stated that the present house was built for the devoted Royalist, popularly known as "Jack" Ashburnham, head of a family who have been seated in Sussex from before the Conquest. John, his grandson and successor, first Baron Ashburnham, was living here at the beginning of last century. His grandson, John, advanced Earl of Ashburnham in 1730, sold his interest in the house to the Crown in that same year. The purchase was made to provide for the greater safety of the Cottonian MSS., which had been in Essex House since 1712, and for the King's Library, founded by Henry, Prince of Wales. Dr. Bentley, Master of Trinity, had succeeded Justel as King's Librarian in 1694. A fire in the early morning of October 23, 1731, greatly damaged the house and contents. Dr. Bentley, who happened to be there, Speaker Onslow, Dr. Robert Freind, head-master of Westminster, and Bentley, resident custodian, exerted themselves to save the books. Freind wrote to Lord Sandon a lively picture of Dr. Bentley, in wig and dressing-gown, rushing forth with the Alexandrian MS. (Codex A), of the New Testament in his hands. Eight years later the Chapter bought, out of a Parliamentary grant, the remainder of the Crown lease, and divided the house into two prebendal residences in lieu of four houses Dean Wilcocks had cleared away from against the Abbey walls. It has been the home of Dr. Andrew Bell, Milman, Ireland, and Fynes-Clinton, compiler of "Fasti Hellenici." After the death, 1881, of Lord John Thynne, sub-dean, it was claimed, together with the adjoining house, by the school governors, under terms of the Public Schools Act, 1868. Despite considerable opposition they entered into possession, and employed Mr. Bodley to make alterations. These included the removal of the garden seat, or summer-house, attributed to Jones, against the Refectory inner wall; the substitution of a dwarf wall with iron gate and railing, and ball-capped piers, for the high screen-wall and its gate-house; and the fitting-up, in the first floor, of the "Scott" memorial library. They also erected class-rooms in place of the late Mr. Turle's house—the demolition of which in 1883 disclosed remains of the Necessarium. We published Mr. Aston's drawing, showing the original roof, of temp. Henry VIII., with its quaint dormers irregularly set, on October 20, 1883.

J. T. Smith's drawing of the exterior, done in 1808, and reproduced in aqua-tint for his "Westminster," shows the original hipped attic-roof, with dormers, whereof the southern part was altered in pitch by raising the south wall (1848) for the present top-story. It was then, we believe, that the dome of the great drawing-room was, so to say, flattened down for relaying the floor above. That floor has slight joists of recent deal, laid east and west, over the central oval of the ceiling below, on each side are massive oak beams, north and south; the central oval lacks the inner moulding around the two lateral panels.* These changes are clearly brought out in Mr. Harry Sirr's measured and annotated drawings, with plans, sections, and details of the entire interior published by us, to a reduced scale, on March 14, 1885.

It has been questioned of late years whether Inigo Jones was the architect of Ashburnham House. In his print, cited above, Smith describes it as "said to be built by Inigo Jones," and there the doubt may have begun. The point has been discussed in our correspondence columns (June 25,

July 2, 9, 1881; Jan. 7, 21, 1882). The late Wyatt Papworth's "Renaissance and Italian Styles of Architecture," &c., 1883, has this entry—

1640. London. Ashburnham House.
I. Jones; now considered to be by J. Webb.

In the "Dictionary of Architecture" we read, s.v. John Webb (1611-72)—

Ashdown Park, Berkshire, is attributed to Webb: who is now considered to have carried out *cir.* 1640 (query too early) Ashburnham House, from the design of Jones.

Yet under the heading "Inigo Jones," it is named undoubtedly under date 1640, in the List of Works designed by and, probably executed under Jones. Of Isaac Ware's "Designs of Inigo Jones and Others," Nos. 6 and 7 are the plan and section of "a staircase by Inigo Jones"—clearly that under review; No. 24 is the "plan and elevation of a seat by Inigo Jones"—the garden-seat cited above. No 23, "An Alcove," is the only plate of the fifty-three which has no architect's name; it is the dining-room alcove, delineated in Mr. Sirr's drawings. That alcove, then, may be Ware's. It is similar to one, attributed by some to him, and bearing the Shiffler coat-arms, in Lindsey House, Lincoln's In-fields, designed by Jones, as Mr. Alfred Marks pointed out in a letter we printed on Jan. 7, 1882. But in regard to the staircase here illustrated, we think its attribution to Jones may be considered to be established.

Mr. Wonnacott's carefully executed perspective drawing of the staircase was made in competition for the Silver Medal for Perspective Drawing offered by the Royal Academy in 1893. As permission to measure the work was refused by the authorities of Westminster School, Mr. Wonnacott found himself much indebted to the set of measured drawings made by Mr. Harry Sirr, already referred to, and for information given by their author.

The staircase now forms a part of the buildings of Westminster School, and is easily accessible to visitors, on applying to the official at the School gate, although, as already hinted, a serious student is prevented from either sketching or measuring there. It is the principal remaining feature of old Ashburnham House; it is crowned by an oval dome supported on twelve small columns forming an arcade round the gallery of the floor over the staircase. The ceiling is richly ornamented in modelled plaster, similar in design to that of the great drawing-room (also by Inigo Jones), and the large wall panels between the pilasters are filled with tapestry of a conventional pattern.

It is not generally known that Inigo Jones was early in life apprenticed to a joiner before William, Earl of Pembroke, took the youth under his patronage, and sent him to Italy, where he continued his studies later by the favour of Thomas Howard, Earl of Arundel. One can imagine, therefore, the loving care with which he produced the design and its details here illustrated.

Several views of this fine piece of work are to be found in various books, notably in Mr. Loftie's "Inigo Jones and Christopher Wren," where a distorted photograph forms the frontispiece to the book. Two photographs are to be found in the series published by the now defunct "Society for Photographing Relics of Old London": a small pen sketch by Mr. Herbert Railton in an article on "Westminster" in the *English Illustrated Magazine*; while Sir John Soane's large drawings of the work, prepared specially to illustrate his Royal Academy lectures, are still preserved in the Soane Museum.

"NORMAN'S WOOD," SURREY.

THIS house, situated on high ground about four miles from Farnham, has just been completed for Mr. George Field.

From its position on one of the highest ridges of the Surrey hills it commands an unusually extensive view of the country round.

The materials used are red brick, in alternate courses of light and dark, with Stoke ground and St. Albans stone-dressings, small green slates being used for the roof. The floors are fire-proof, on Messrs. Fawcett's system, and wire lathing is used throughout.

The ground-floor contains hall, lavatory, hats and cloaks saloon, and staircase, drawing-room, dining-room, billiard-room, library, and the usual servants' offices; above are twenty bedrooms, bath and dressing-rooms, &c. The larders and cellars are on the basement.

Mr. Percy G. Stone is the architect.

"ST. MARGARET'S," MOUNT PARK HARROW.

THIS house has just been completed at Mount Park, Harrow, for Mr. Andrew Devitt. The house stands on a high site of an acre in extent, with beautiful views on three sides, whilst the rising ground on the fourth side is well wooded. The principal front faces south-east. This front, occupied by the dining- and morning-rooms, is the entrance-hall. The drawing-room has south and north-west aspects. The house contains twelve bed and dressing rooms, and special care has been taken to make the structure economical and simple in working. The roofing is simple, with no internal gutters; and the chimney stacks, which there are only four, are all on internal walls. The house has been built by Messrs. T. Turner & Co., Limited, of Watford, who have carried out their contract without extras. The work was placed in Messrs. Turner's hands without competition. The cost, including fencing, was well under three thousand pounds. The roof-tiles are hand-made, the wall-tiles pressed. The red facing bricks are from Leverstock Green, the windows to hall and the porch are of Ham Hill stone. Messrs. Elsiey supplied the stove. Messrs. Hope supplied the iron casements. The baths and range were specially made by Messrs. Wontner Smith, Gray, & Co. Many of the finger plates and other ornamental metal work have been specially designed and made. The architect is Mr. Arnold Mitchell.

THE FOX ALMSHOUSES, NORTON CO. DURHAM.

THREE almshouses are to be erected under the Charitable Trust, created under the will of the late John Henry Fox, of Norton.

Separate houses are provided for twelve old men, a porter's lodge, a common room, and clerk's office. The site is on the west side of the quaint old village of Norton. It will be seen that all living and bedrooms have a sunny aspect, and a large grass forecourt. The walls will be built of thin red bricks, and the roofs covered with Staffordshire tiles.

The architects are Messrs. Clark and Moscrop, whose design was selected in the recent competition.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council, the last prior to the summer recess, was held on Tuesday, in the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Loans for Public Works.—On the recommendation of the Finance Committee, it was agreed to lend the Battersea Vestry 10,000*l.* for a local improvement; the Vestry of St. Luke, 2,000*l.* for sewer and other works; the Shore-ditch Vestry, 10,000*l.* towards the cost of a local improvement; the Vestry of St. Pancras, 30,000*l.* for electric lighting works, and 26,100*l.* for destructor works in connexion; the Wandsworth Guardians, 40,000*l.* for the purchase of premises to be used as a workhouse; the St. Pancras Guardians, 9,000*l.* towards defraying the cost of erecting casual wards; the Poplar Guardians, 3,500*l.* for additions to the workhouse; the Metropolitan Asylums Board, 104,131*l.* for providing additional hospital accommodation; and the Islington Vestry, 51,000*l.* for electric lighting purposes.

The Council Employés and Extra Work.—The General Purposes Committee brought up the following report:—

"On November 20, 1894, the Council passed the following resolution, viz.:—'That, in the opinion of the Council, every officer and workman in the employment of the Council should devote his whole time to the Council's service, and should not be allowed to take any private business or paid employment, and that it be referred to the General Purposes Committee to prepare and submit a standing order to that effect.' We have carefully considered the references to us, and have had the advantage of two interviews with representative of the staff. On the last occasion these gentlemen put their views into the shape of a printed memorandum, copies of which I have now circulated to the Council. In this memorandum the staff asks us to recommend the Council either to rescind the resolution, so far as it relates to the words 'and should not be allowed to take any private business or paid employment,' or deal with it in such other manner as shall not prevent the exercise by the members of the staff of the reasonable liberty which they have hitherto enjoyed in the employment of their out-of-office hours. We feel it impossible to comply with the first request, in our opinion any definite withdrawal of the work mentioned would operate as an admission that the

* See Mr. Charles B. Scott's letter, the *Times* of Dec. 3, 1881; and the *Builder* of Jan. 14, 1882.



*Norman's Wood in the county of Surrey.
for George P. Field Esq.*



Kitchen Garden

The Stables and Coach houses

Servants Ent

The North



Billiard room

Drawing room

Dining room

The South



the Principal Entrance

the Hall

the Library

Prospect



Kitchen

Teacher's room

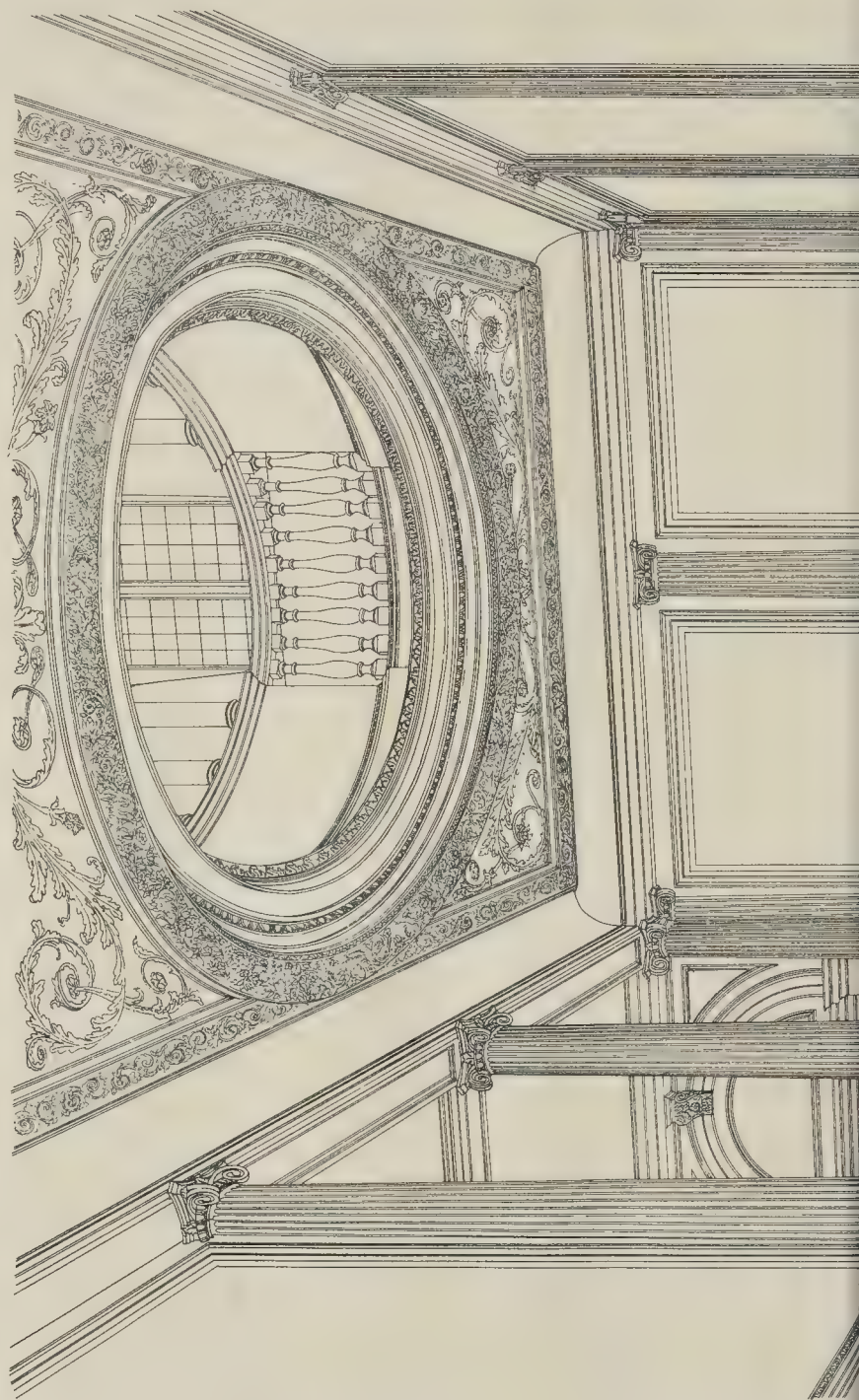
Prospect.

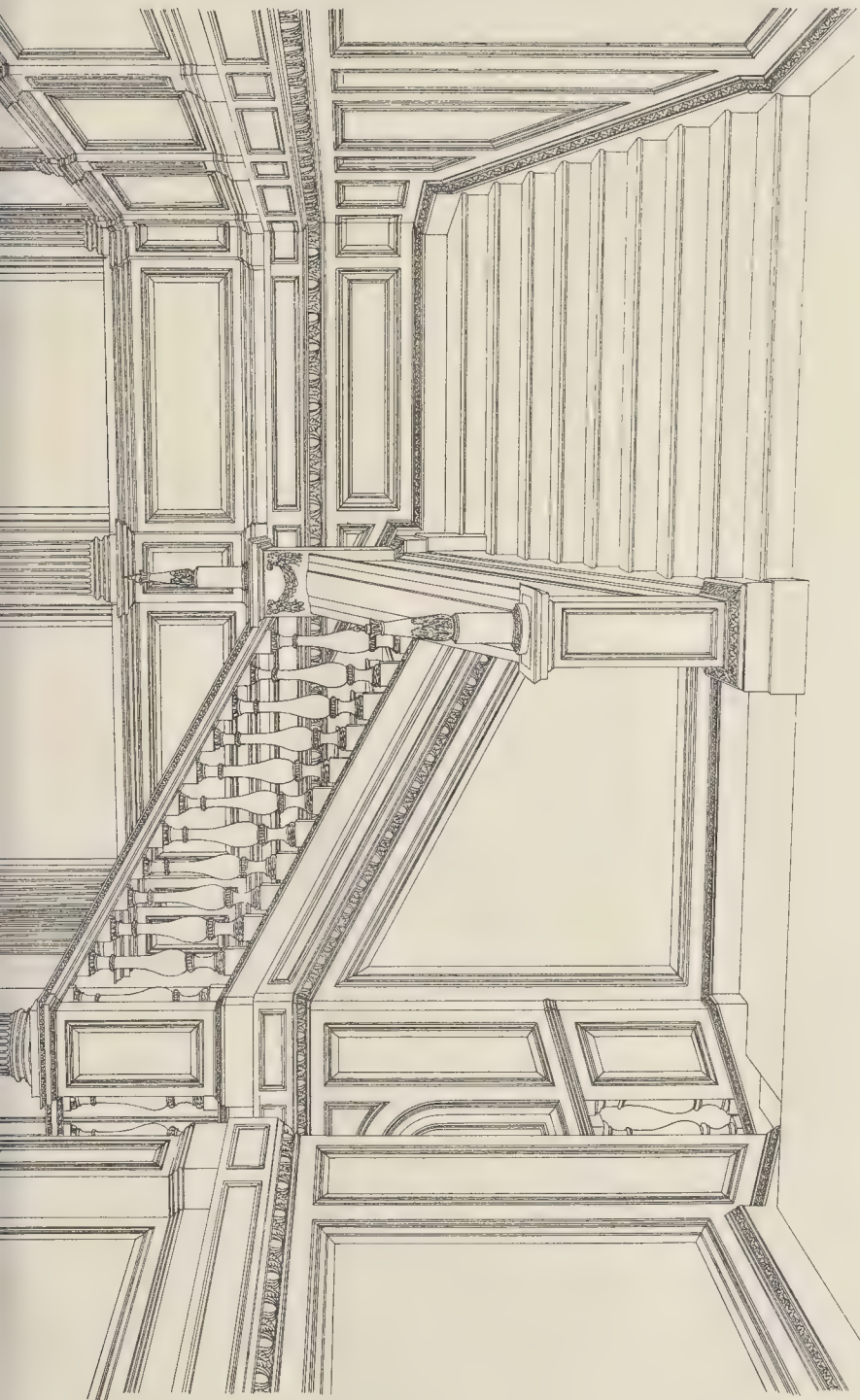
Percy G. Stone
inv^d et del^d Mar 1895



THE BUILDER, AUGUST 3, 1895.

THE STAIRCASE : ASHBURNHAM HOUSE : WESTMINSTER



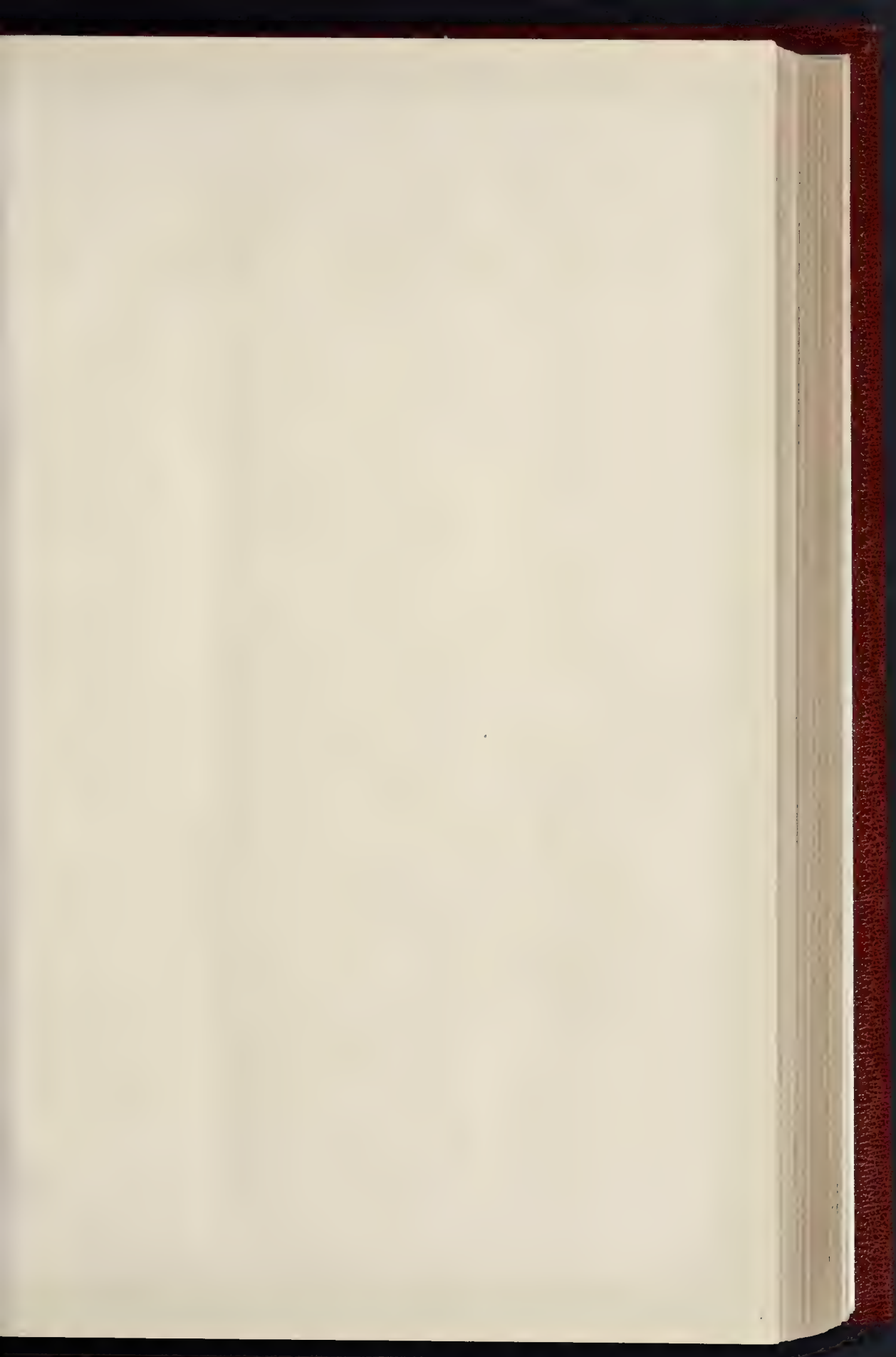


W. WORMACOTT 1895

FORMERLY ◊ THE ◊ RESIDENCE ◊ OF ◊ THE ◊ REV^d ◊ CANON ◊ LORD ◊ JOHN ◊ THYNNE ◊

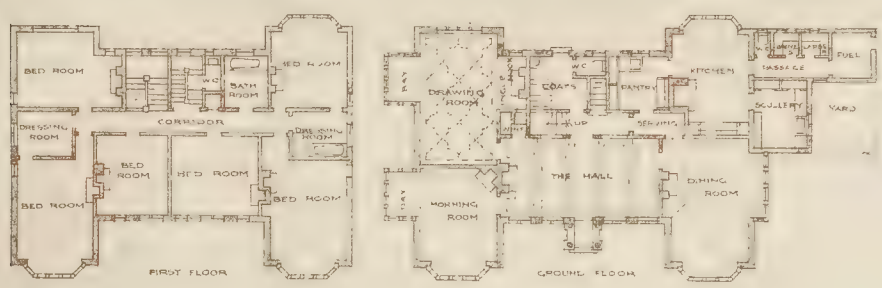
PHOTO LITHO SPRAGUE & CO. 43 EAST HARRISON STREET FIFTY LINE E.C.

Awarded Royal Academy Silver Medal for Perspective, 1893

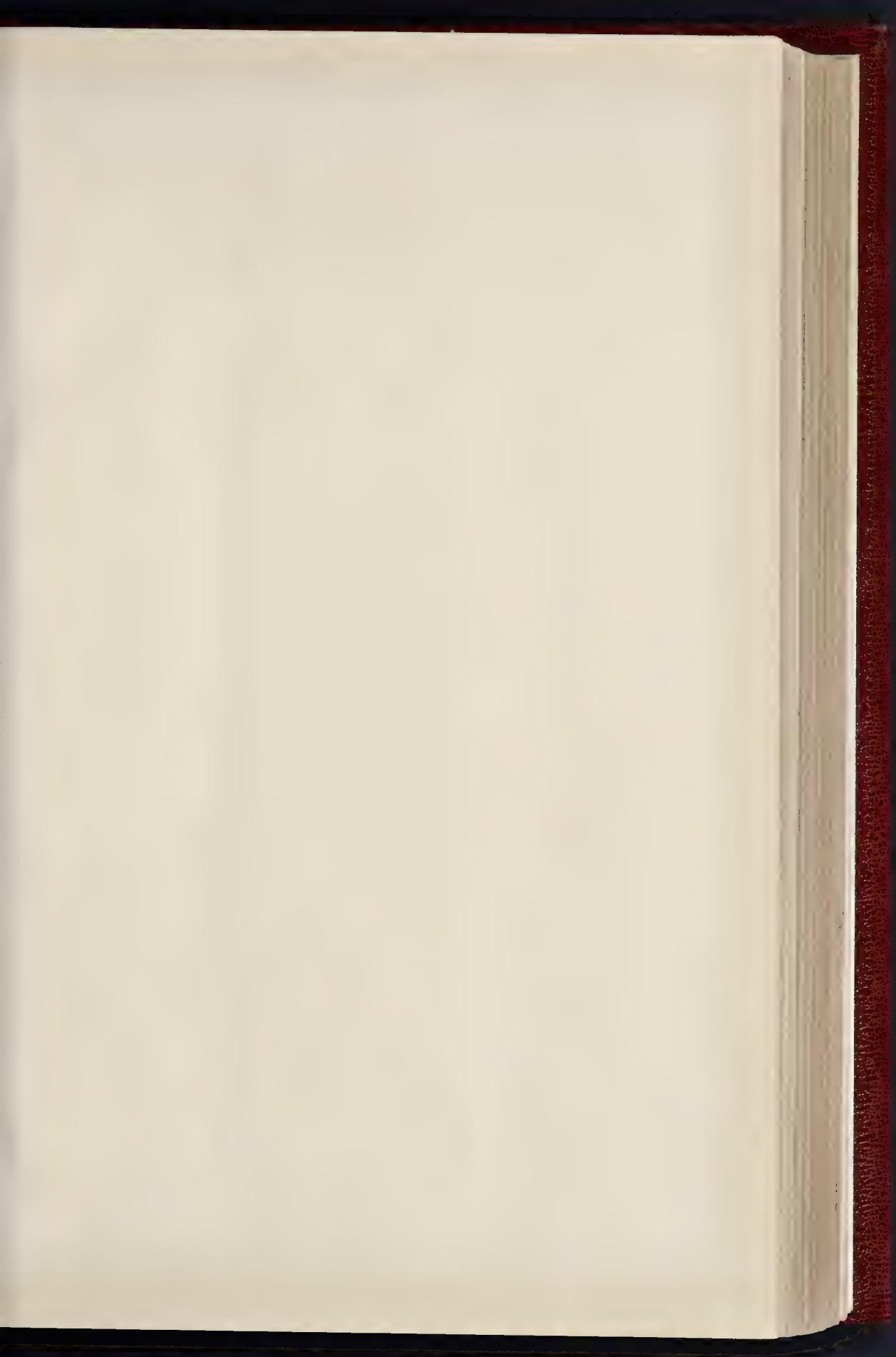


St. Margaret's : Mount Park:
HARROW:
for Andrew Devlin Esq^r





Howard Mitchell
Architect
16 Finsbury Circus, E.C.





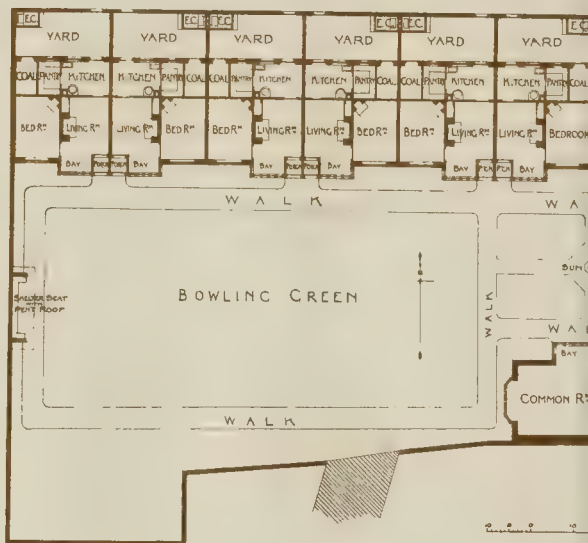
South Elevation



East Elevation
Porter's Lodge



Section

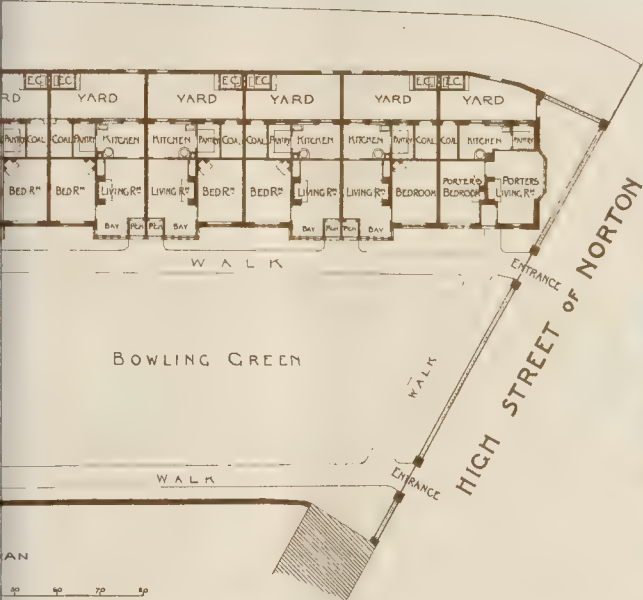


View
Scale



Houses

Porter's Lodge,



West Elevation
OF
Common Room



North Elevation of Office
Common Room

Street
IONS & C

NORMAN'S WOOD, SURREY. FOR GEO FIELD ESQ



Council countenanced the practice of officials doing outside work. We not only believe that the Council would not wish to place itself in such a position, but we also think it essential for the staff to know that the spirit of the Council's resolution is intended to be strictly observed. At the same time we deem it inexpedient to frame any standing order which shall operate as a literal prohibition of all work done outside of office hours, as we agree that reasonable liberty may properly be allowed to the members of the staff in the employment of their leisure time. We have no reason to think that such liberty has been or will be abused, but were it taken advantage of in any particular case, the resolution of November 20 could at once be brought into operation. We therefore think that the wisest plan is for the Council to take no further action at the present moment, and we recommend—"That the reference be discharged."

Mr. Boulton, M.P., moved the following amendment:—"That the report be referred back, with an instruction to the committee to bring up a standing order in lieu of that previously directed, which will provide that members of the staff shall not, either in or out of office hours, employ their time in any occupation of a character inconsistent with their duty to the Council, or in such a manner as to detract from their capacity for the due performance of that duty." The resolution to which he objected was carried at the instigation of the trade-union representatives. If the Council were to be continually dictated to by the trade-unionists a great deal of mischief and trouble must result.

Mr. Marks, M.P., seconded the amendment, which would only put the Council's employees in the same position as the employees of private firms.

Mr. Crooks opposed the amendment, and protested against what he called the selfishness of working men, who, having regular work, were mean enough to do the unemployed out of any odd job.

Sir John Hutton then moved to proceed with the next business, and the motion having been seconded, was carried on a division by 49 to 46.

Housing Scheme, Somers Town.—The Public Health and Housing Committee reported progress on the Somers Town scheme, which it was proposed to carry out at a cost of 36,550*l*. The heads of the scheme were as follows:—"That Lady Henry Somerset should agree to sell to the Council her land at Churchway, Somers Town, subject to all existing leases and tenancies, at a price. That the Council should then make use of its statutory powers and clear the area of all

existing occupants and interests. That the Council should, on this being done, resell to Lady Henry Somerset's trustees the cleared area at the same price at which the Council had purchased it, plus such sums as it should have expended in clearing it. That Lady Henry Somerset should agree to erect, or cause to be erected, proper and substantial dwellings on the area within a fixed period. That the Council should undertake to provide a 40-ft. road within a fixed period." After an animated discussion the report was agreed to.

Boundary-street Improvement Scheme.—The Public Health and Housing Committee recommended as follows:—

(a) That, subject to estimates being submitted to the Council by the Finance Committee as required by the statute, the work of erecting the superstructures of blocks B, G, and I (sec. B), of erecting the block on part of section E, comprised in the Boundary-street improvement scheme, and of erecting the superstructure of Idenden-cottages, be executed by the Council without the intervention of a contractor, and that the plans, specifications, and estimates be referred to the Works Committee for that purpose; but that, in the event of that Committee not being satisfied of the sufficiency of the estimates, the Public Health and Housing Committee be authorised to invite tenders for the works.

(b) That to avoid delay in proceeding with the works, standing orders No. 289 and No. 177 be in this instance suspended, and that, if tenders are invited, the Committee be authorised to open them and accept such as may be the most satisfactory. (c) That the solicitor be instructed, in the event of tenders being accepted, to prepare the necessary contracts, and that the Council do authorise the sealing of such contracts when prepared. The same Committee also recommended:—"That, subject to a supplementary estimate of 1,107*l* being submitted to the Council by the Finance Committee in accordance with the statute, the foundations of the buildings to be erected on a portion of section E of the Boundary-street area be carried down to the solid ground, that an amended estimate of 28,168*l* be referred to the Works Committee, and that Mr. Plumbie be employed as the architect of the buildings." The recommendations were agreed to.

The Water-Supply Question.—Mr. Idris, Chairman of the Water Committee, stated that no reply from the East London Water Company had yet been received in regard to the inquiries which the Council directed to be addressed to the Company. In anticipation of the Company's communication he had obtained reports from the Council's Parliamentary Agent and Engineer.

The Agent (Mr. Cripps) denied most emphatically that the rejection of the East London Water Bill in 1893 was due to the opposition of the London County Council to the Company's proposed extension of their works. It was due to the arbitrary and onerous conditions which the Company sought to impose upon their customers, and which called forth opposition from all parts of the district. There was no opposition on the part of the Council to the Company making additional works.

The Clerk (Mr. De la Hooke), read the following report of the Council's Engineer, Mr. Binnie:—

"I have been endeavouring to discover, if possible, the cause of the shortness of water in the East-end, and I think that I have detected the cause. I have had tables prepared founded on the official water examiners' reports, showing the total quantities supplied by the East London Company during the years 1892, 1893, 1894, and the first five months of 1895. During 1892 the average daily supply was at the rate of 433 million gallons, varying from about 41 million gallons in November to 452 million gallons in January. In 1893 the average supply was at the rate of 41,900,000 gallons, varying from 37½ million gallons in October to 51,600,000 gallons in January. In 1894 the daily average was 41,400,000 gallons, varying from 37,600,000 gallons in October, when there was shortness of supply, up to, say, 44 million gallons in January. During the first five months of 1895 I find that the average supply has been at the rate of over 53 million gallons a day, varying from 45 millions in January up to 59 millions daily in February, since when they have drawn during March 54,400,000, April 55,300,000, and May 51,162,000. From this we see that the month of January in the years 1892, 1893, and 1894 was the month during which the heaviest demands were made on the company. During January, 1895, 45 million gallons were consumed, a not unprecedented amount during that month, but during the months of February, March, April, and May the quantities supplied to the district have exceeded any previous record. From our inspection of this increase my belief is that what the company are now suffering from is not an insufficiency of supply, but that their pipes became so shattered during the frost in February last, as to become so leaky that the water is wasted and does not reach the consumers. From the table attached it will be noticed that in no month during the years 1892, 1893, 1894, or 1895, have the company ever availed themselves to the full extent of their power to draw the water which they have boasted before the Royal Commissioners either from the Thames or wells in the Lea valley. On a

previous occasion I drew attention to the fact that during last year the New River and East London Companies abstracted from the River Lea about 52½ million gallons a day. During the present year the draft from that river by these two companies has been as follows:—

January	59,800,000
February	71,900,000
March	67,200,000
April	69,200,000
May	61,000,000

which is decidedly antagonistic to the reports of both the Royal Commissions of the Duke of Richmond, 1860, and of Lord Balfour of Burleigh in 1893. As I have pointed out, a large increase of water, amounting to 26 per cent. of that in 1894, or 26 per cent. in excess of the supply during the remarkably dry year of 1893, can only be accounted for by some sudden alteration in the rate of the consumption in the district supplied or by an enormous amount of leakage.

The following urgency report of the Water Committee was then considered:—"Having regard to the numerous complaints of defective water supply, especially with respect to the East London Company's area, we think that the necessity may arise for taking some action during the recess, and we recommend, 'That any action which it may be necessary to take in consequence of the present condition of the water supply be referred to the Water Committee and the Public Control Committee, sitting jointly, with power to act during the recess, notwithstanding any resolution of the Council.'"

Mr. Beachcroft questioned what powers could be exercised by the committees during the recess. The proper course would be to apply to the Local Government Board to deal with the Company. He again protested against the attempt to shuffle out of the responsibility of the Council for having expended 1,400l. in opposing a Bill which would have given the company ample storage accommodation.

Mr. McDougall said the Limehouse local authorities, being unable to get sufficient water from the Company for watering the streets, on Monday applied to the Thames Conservancy for leave to pump water out of the river.

Mr. Sidney Webb suggested that the Company should have stopped their water-supply to manufacturers, which was voluntary, in order to fulfil their statutory obligations to householders; but the Company had chosen to adopt the opposite course.

A motion to close the discussion was agreed to, and the recommendation of the Committee was adopted.

The Council then proceeded to deal with the following report of the Water Committee, the recommendation being agreed to:—

"It will be in the recollection of the members of the Council that the recent Royal Commission reported that the supply of water required for the Metropolis was likely to increase from 171 million gallons to 415½ million gallons in 1931, thus more than doubling the present supply. The principal source from which it was suggested, that this quantity should be obtained was, among others, 300 million gallons from the River Thames; but, as pointed out by the water companies, who submitted the Thames scheme to the Royal Commissioners, it was based on the assumption that the Thames could be treated similarly to the Lea, that is, that nearly all the water could without harm be abstracted from it. Further investigations which have been carried on since the date of the Royal Commission have proved that this quantity cannot, having regard to the general welfare of the Metropolis, be abstracted with safety from the river, and that the purity anticipated by the Royal Commissioners can hardly be expected to continue in the future with the present increasing population of our 1,000,000 persons in the Thames valley, as the recent investigations of the water examiner have shown that the present filter beds are unable to cope with the discoloured flood-water which comes down the Thames, which water is always charged with large amounts of bacterial life. From recent calculations which have been made on the actual flow of the river, it is found that were the scheme proposed by the water companies carried out the Thames would for several months each summer be reduced to a flow of only 200 million gallons a day at Teddington weir, and the chemist has recently pointed out in his report, which has been circulated, that whenever the flow over Teddington weir falls below 200 million gallons daily so little strength of current remains in the lower river that sea-water flows up as high as Hammersmith and Kew, and consequently the river flowing through London would soon get into a state of impurity similar to the Lea were it treated as proposed by the water companies. It is therefore important that investigations should be carried on as to the possibility of obtaining a purer and more certain source of water-supply than that afforded by the Thames, and this is the more pressing as the gathering grounds, from which alone a sufficient quantity can be obtained,

are gradually being appropriated by other towns. Consequently, on February 12 last, the Council, on the report of the Water Committee, passed the following resolutions:—(1.) That the Council is of opinion that the scheme for a system of storage reservoirs, presented to the Royal Commission on Water Supply by the water companies, coupled with the proposal to abstract large additional quantities of water from the rivers, is not the proper method of meeting the future wants of London.

(2.) That any further capital expenditure on works in the Thames and Lea valleys for the supply of London should be regarded as of a temporary character, and should be restricted to such improvements as may be for the time indispensable.

(3.) That the true solution of the problem is the obtaining of the necessary additional supplies from a purer source; and that accordingly the Water Committee be instructed to proceed with the preparation of a scheme to be presented for the consideration of the Council as soon as possible, with a view to an application to Parliament for the necessary powers. The Council is aware, from the report above referred to, as well as from previous reports, that the Engineer has for some time been investigating sources of supply outside the county of London, and under resolutions passed on October 30 and December 18 last we have been authorised to obtain assistance for the survey of reservoirs contemplated in the Engineer's scheme. These, however, although important portions of the work, are but a small fragment, as the total survey would cover for reservoirs and their allied works at least 9,000 acres, and would extend over 350 miles of conduit, and were it prepared for Parliament in such a way as to comply with the standing orders it would be one of the largest parliamentary schemes ever deposited. The urgency of the matter is emphasised by the default in supply reported in preceding paragraphs. Hitherto the Engineer's report has been regarded as a confidential document, but we think the time has arrived when it should be brought to the knowledge of the Council, and we have accordingly given directions for its circulation, with a map of the locality affected.

During the protracted proceedings in Parliament with respect to the Council's transfer Bills we have refrained from moving in the matter beyond the extent already authorised by the Council, for the obvious reason that had we done so our action might have been construed by our opponents into the assumption of a threatening attitude on the part of the Council. Under these circumstances, the Engineer has asked for further instructions in the matter, his own opinion being that sooner or later a supplemental scheme will have to be considered. It is hardly necessary to say that we concur in this view, inasmuch as we have already gone fully into the matter in our report presented on February 12 last, and we have therefore no hesitation in advising the Council to proceed. We do not anticipate that the Council will be in a position to go to Parliament before the session of 1897, but even then there will not be too much time at our disposal to mature the project. Of course, until the works are properly surveyed, the scheme cannot be submitted to the Council or to Parliament with that authority which such a scheme should carry with it, and we are of opinion, therefore, that measures should be at once taken on a more extended scale, to enable us to give effect to the Council's resolution quoted in this report. In anticipation of the work which would have to be done, we estimated our expenditure for the year ending March 31 next at 5,000l. Up to the present time the expenditure authorised will probably not exceed 2,000l., or perhaps 2,500l. This leaves a sum of 2,500l. available within the limit of our estimate, and we recommend—

"That, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, we be authorised to expend a sum not exceeding 5,000l. between this and March 31 next, in making further surveys and obtaining other necessary information with respect to the scheme which we have under consideration, and that under our instructions the Engineer be authorised to expend any sums within the limit named which it may be necessary to expend during the ensuing recess, it being understood that, in authorising this expenditure, the Council is in no way pledging to proceed further in the matter, without further considering the whole matter."

Lambeth Bridge.—On the recommendation of the Bridges Committee it was agreed that the Parliamentary powers should be asked for widening the eastern approach to Lambeth Bridge.

Savoy Hotel Sky-sign.—The Building Act Committee, having unsuccessfully prosecuted the Savoy Hall for an alleged "sky-sign," and the magistrate having refused to state a case, the Committee desired permission from the Council to apply to the High Court for a mandamus.

The report was adopted.

The Council adjourned soon after seven o'clock.

BUILDERS' ACCIDENT INSURANCE, LIMITED.

THE fourteenth annual general meeting of this company was held on the 26th ult., at the registered offices, 31 and 32, Bedford-street, Strand, London, W.C., Mr. Stanley G. Bird in

the chair. The Secretary, Mr. R. S. Henshaw, read the following report:—

"1. In presenting their fourteenth annual report, the directors have to record a reduction in the premium income of 111l. 9s. 10d., and an increase of 252l. 8s. 11d. in the amount paid in claims, as compared with last year.

"2. In explanation of the foregoing figures the directors wish to remind the insurers that last year they informed that the directors had been subjected to very careful scrutiny of the risks, aided by Mr. George King, F.I.A., the actuary. The result of this investigation is that the directors have been obliged to refuse to renew some risks and have also increased the premium in others. Consequently the premium income shows a slight falling off.

"3. During the past year the company has dealt with 588 accidents, including fifty-nine under Class 3, as compared with 602 and fifty-six respectively for the year 1893-4.

"4. The increase in the amount of claims paid is due principally to two or three exceedingly heavy payments under Class 3. The claims under the ordinary risk for accidents to workpeople are considerably below those of the previous year.

"5. The remuneration of the directors for their services during the past year will, as usual, be left to the members in general meeting.

"6. As Employers' Liability is one of the subjects mentioned by the present Government as part of their programme, it may reasonably be expected that a Bill treating with it will be laid before Parliament very shortly. Any Bill will probably be more onerous for the employer, though it is not unlikely that some scheme may be devised for the workman making some contribution, and all cases of injury being compensated.

"7. In accordance with the articles of association the following directors retire:—Messrs. William Southern, Joseph C. White, and J. Howard Colls, all of whom are eligible and offer themselves for re-election."

The Secretary also read the statement of accounts.

The retiring directors and the auditor having been re-elected, the meeting terminated with a vote of thanks to the Chairman for his services during the past year.

THE BUILDERS' BENEVOLENT INSTITUTION: ANNUAL MEETING.

THE forty-eighth annual meeting of this charity was held on Thursday, July 25, at the offices, 35, Southampton-row, Bloomsbury. Mr. Basil P. Ellis (the President) occupied the chair, supported by Messrs. George Plucknett, J.P. (Hon. Treasurer), Thomas Stirling, W. Scrivener, E. M. W. Goslett, and other friends of the Institution.

The Secretary (Major Brutton) read the annual report, which stated that the Institution continues to carry into effect its purposes as usual, the only drawback being the need of increased income to provide for all the necessitous applicants who seek the benefits of the charity. This is especially to be regretted, because some are very aged before making their wants known. The committee's efforts have been much hampered by the diminution of subscriptions, consequent upon the death of many regular subscribers, and this makes it an earnest and urgent matter to endeavour to obtain new subscribers and donors, in order to maintain the Institution. This state of affairs cannot be too widely known to the patrons. A movement has been set on foot for the Secretary to call and solicit subscriptions or donations from all members of the building and allied trades within the metropolitan district, which it is hoped will be attended with good practical results. At the present time there are forty-six pensioners on the funds, while others are waiting for election until the income is sufficient. Four female pensioners have died within the past year; one man and one woman have been elected. The Committee strongly express their gratitude to the President, Mr. Basil P. Ellis, for the lively interest he takes in the transactions of the Institution, and for his determination to get very liberal contributions to the charity. They also offer their thanks to the Stewards of the annual dinner, and to the Honorary Auditors for their services. The Committee have further the pleasure to announce that Mr. John Mowlem Burt, J.P., D.L., has accepted the Presidency for the ensuing year, and will preside at the annual dinner on November 7 next, in the Hall of the Worshipful Company of Carpenters, London Wall.

On the motion of Mr. Thomas Stirling, seconded by Mr. Goslett, the report and balance-sheet were unanimously adopted.

Mr. Plucknett proposed a cordial vote of thanks to the outgoing President for his exertions

d of the Institution during the past twelve years.

Mr. Stirling seconded the motion, which was carried by acclamation.

The President returned thanks, and said that he was pleased he had been able to do something for the charity. The success which had already attended the movement for increasing the number of subscribers was largely due to Major Brutton, who had been most assiduous in calling upon those who were likely to help.

Notes of thanks were also passed to the Vice-presidents, and Trustees, to the Hon. Treasurer (Mr. Plucknett), who was re-elected, and to the Hon. Auditors. The retiring members of Committee were also reappointed, with the addition of Mr. Ellis.

On the motion of the President, Mr. John Wilm Burt, J.P., D.L., was elected President for the ensuing year, and a vote of thanks to the Chairman for presiding closed the proceedings.

NATIONAL ASSOCIATION OF MASTER BUILDERS.

THE National Association of Master Builders of Great Britain held its thirty-fifth half-yearly meeting, in the Arbitration Room, Royal Exchange, Leeds, on the 23rd ult., when representatives were present from London, Liverpool, Manchester, Birmingham, Bradford, Huddersfield, Bolton, Derby, Preston, Leicester, Walsall, Macclesfield, Newcastle-on-Tyne, Bristol, Hull, Leeds, Southampton, Nottingham, and Blackburn. County Alderman John Bowen, J.P., Birmingham, was the President, presiding.

The report for the past half-year was approved and adopted, and ordered to be printed and circulated amongst the members.

Mr. C. W. Green, Liverpool, the honorary secretary, submitted his audited accounts for the half-year, showing the Association to be in a satisfactory financial position.

The President explained to the meeting the reasons which had been adduced in reference to the Plumbers' Registration Bill, introduced into Parliament last Session, and impressed upon the members the desirability of strongly opposing the Bill should it be again introduced.

A letter was read from Mr. Stanley G. Bird, London, giving an account of the result of negotiations, which had extended over a long time, with the Royal Institute of British Architects with reference to the proposed new form of contract, and expressed much regret that, owing to the course adopted by the Royal Institute of British Architects with regard to the arbitration clause in the form of contract, the whole matter had practically fallen through.

Mr. John Dawson, of Huddersfield, in discussing his view as regards the Employers' Liability Bill, strongly urged the members to exert themselves against the risk of accidents to their workmen.

Mr. T. F. Rider, London, gave a short account of the cause of the action which had been instituted by the Master Plasterers' Association of London against the National Association of Operative Plasterers, which had, for some considerable time past, systematically persecuted and endeavored to get boycotted certain master plasterers in London with whom they may have had some grievance.

Mr. Rider explained that this was one in which master builders generally were concerned, and they should make a point of giving all the support they could in order to strengthen the action taken by the above body. It was decided that the Association should render the support it could, both financially and otherwise, to the Master Plasterers' Association of London.

Various other matters interesting to the build-trade were discussed, amongst which reference was made to apprentices' indenture-forms, some being drawn up in such a manner as to render the employer liable to maintain the apprentices when unable to work through illness.

Mr. Wm. Irwin, of Leeds, was unanimously elected a member of the Council to fill the vacancy occasioned by the resignation of Mr. Wm. Mawson.

It was resolved to hold the next half-yearly meeting in London.

A hearty vote of thanks accorded to the President for his able services in presiding at the meeting concluded the proceedings.

In the evening the members were entertained at the Leeds Master Builders' Association at dinner in the Queen's Hotel, when Mr. William Irwin, the Vice-President of that Association, addressed in fitting remarks the pleasure it afforded the Leeds master builders to have the

opportunity of receiving the representatives of such an important industry, and commented upon various matters relating to the building trade.

County Alderman John Bowen, in thanking the Leeds master builders for the enthusiastic reception accorded to the National Association, commented generally upon the objects for which the Association was formed, and called the attention of the members to the fact that defence, and not aggression, was one of the principal objects in view, and strongly urged all master builders to stand shoulder to shoulder, and be united in action, as it is only by this means the combinations of the operatives can be easily and effectually dealt with.

A vote of thanks was accorded to the Leeds Master Builders' Association for the hospitality shown by its members, and the enthusiastic reception given to the representatives upon the occasion of their visit.

Those delegates remaining in Leeds until Wednesday were conducted through the British Screw Works, Roundhay Park, and Eccup Reservoir, after which the contractor for the latter, Mr. J. Gould, provided tea for them at Eccup.

COMPETITIONS.

DURHAM COUNTY BUILDINGS.—At the last meeting of the Durham County Council the Finance Committee reported that Messrs. Cooksey & Cox, and Messrs. Barnes & Coates having delivered to the clerk satisfactory contractors' tenders to construct new county buildings, in accordance with their plans (marked "Onward" and "Demos"), for the sums named in their estimates, they recommended that those tenders be approved and the premiums paid. They also asked the authority of the Council to proceed with the new county buildings on the plans sent in under the signature of "Demos," with such alterations and modifications as they might think desirable, so that the cost should not exceed £22,000. Alderman the Rev. A. D. Shafto moved the adoption of the recommendation. Councillor Bartlett opposed the adoption of the recommendation on the ground that the Committee should not have the power of dealing with this matter before the amended plans and estimates had been before the Council. If expenditure was put down at £22,000, he should say that before they had finished, with what the price of land, interior fittings, &c., which were not included in that amount, the cost would have reached £40,000. He contended that a much less expenditure would be sufficient, and that the Committee intended to provide something far in excess of the requirements of the Council. He moved as an amendment that this part of the Finance Committee's report be expunged. The Chairman was somewhat of the same opinion, and thought that if the Committee altered their report so that it read that the Committee be authorised to proceed with the work with such alterations as "the Council" might think desirable, instead of "the Committee might think desirable," it would meet with the Council's approval. Alderman the Rev. A. D. Shafto, the Chairman of the Committee, had no objection to the alteration, and the report was adopted subject to the proposed amendment.

IPSWICH WORKHOUSE.—Six designs of competitors for this building were remitted by the Guardians to the assessor, Mr. Charles Barry, who has awarded the first premium to Messrs. Stephen Salter, Lister Newcombe, and H. Percy Adams, of 28, Woburn-place, Russell-square, London, and the second to Messrs. Philip Tree and Ivor Price, of 70, Warwick-road, Earl's Court, London. The following architects also competed:—Mr. G. W. Leighton, Ipswich; Messrs. H. S. Legg & Son, London; Messrs. W. H. Seth-Smith & A. R. G. Fenning, London; and Messrs. C. O. Ellison & Son, Liverpool.

The Student's Column.

METALS USED IN BUILDING.—V.

THE PRINCIPAL ORES (continued).

NICKEL.—This metal does not occur in the native condition; it is principally found in connexion with cobalt ores. Indeed, nickel and cobalt are so closely allied in this respect, that their separation from one another is attended with considerable difficulty. The nickel ore at Sudbury, in Canada, is intimately associated with the mineral chalcocite (copper pyrites; sulphide of copper and iron); the two metals being of very similar specific gravity

cannot be separated by the washing process, and have, therefore, to be worked and treated together. Copper, iron, antimony, and bismuth also enter into the composition of certain nickel minerals. Pure nickel is a white, malleable, highly magnetic metal, though the last-mentioned property is not so strongly marked as in iron.

The following may be given as the principal ores of nickel:—

1. *Silicate of Nickel*, hydrated silicate of nickel and magnesium, free from sulphur and arsenic, and containing from 7 to 18 per cent. of nickel.
2. *Nickel-bearing pyrrhotine* with copper pyrites, with about 4 to 5 per cent. of nickel.
3. *Kupfernickel*, the arsenide (nickel and arsenic), in which antimony and small proportions of iron and sulphur are often present. Theoretically, it contains about 44 per cent. of nickel.
4. *Chloanthite*, the diarsenide (nickel and arsenic), with about 29 per cent. of nickel.

Until a few years ago, the ores mentioned under our third and fourth categories were the only ones exploited. The chief source of the metal at the present day is the hydrated silicate of nickel and magnesium, an ore found in considerable quantity in New Caledonia. Its method of occurrence is somewhat remarkable. The ore is always obtained at or about the junction of the rock serpentine, with a peculiar red clay, which latter sometimes has lumps of oolitic iron ore remaining in it near the surface. The clay is disposed in deep pockets of irregular character, and generally contains the hydrated oxides of cobalt and manganese, though the ore (nickel, &c.), is never found in this ferruginous clay. Another manner in which it occurs, in the same island, is as a net-work of veins in the serpentine, though these occupy the same relative position in the aggregate, with reference to the ferruginous clay alluded to.

The second ore mentioned, the nickel-bearing pyrrhotine (magnetic sulphide of iron) associated with copper pyrites, is closely related to kupfernickel, and would not be mentioned separately except for its different behaviour in certain metallurgical operations of interest to us, as will be seen hereafter.

The best-known ore is kupfernickel, which the student might imagine, at first sight, to be a compound of copper and nickel, but its name is derived from the coppery appearance of the ore when tolerably pure; though quite unconnected with this, it is sometimes found with copper ores. It is usually massive, is opaque and brittle, and turns to a metallic black on exposure for any length of time to the atmosphere. It is found in some abundance in Germany, and to a smaller extent in Austria, Spain, Norway, France, Siberia, Chili, and the United States. In this country it is known to occur in several Cornish mines, where it is generally mixed with cobalt and, rarely, with bismuth, especially at St. Austell Consols mine; also at Batgate, in Llanthegwyn, and in Flintshire. No nickel and cobalt ore was raised in Great Britain last year; the only mine recently worked for it is in the last-mentioned county, where an instance was afforded of the occurrence of the mineral asbolan (earthy cobalt) with red clay in irregular cavities in Carboniferous Limestone.

In reference to chloanthite (the diarsenide of nickel), or white nickel, as it is sometimes termed from its tin-white appearance, this mineral passes insensibly into smaltine by the nickel being replaced by cobalt; nevertheless, it is a valuable nickel ore, found sparingly in Cornwall, near Keswick, in Cumberland, in certain parts of Scotland; but principally in Saxony, Bohemia, in silver mines in Chili, and the United States.

Cobalt.—This metal usually occurs combined with arsenic or sulphur, and is not found in the native state. The ores of cobalt, as might be anticipated from what has already been said respecting nickel, are intimately associated with that metal, and occur also with silver and copper. Cobalt is white, with a slight reddish tint, and is strongly magnetic. The blue oxide, artificially prepared, is used as a pigment in painting. The following are the principal ores of the metal:—

1. *Smaltine*, or tin-white cobalt, arsenide of cobalt, nickel and iron, which may contain as much as 23 per cent. of cobalt.
2. *Cobaltine*, sulphide and arsenide of cobalt.
3. *Erythrine*, cobalt bloom, hydrous arseniate of cobalt (oxide of cobalt, arsenic acid and water), oxide of cobalt = 37.5 per cent.
4. *Asbolan*, earthy cobalt, essentially "wad," or hydrous oxide of manganese with a variable proportion of cobalt mechanically mixed with it—sometimes as much as 40 per cent.

All these ores are used in the manufacture of small, the two first-mentioned being the most important. Smaltine occurs, in addition to its crystalline forms, massive, or reticulated; it tarnishes on exposure to air, and is usually found in veins associated with ores of silver, copper, &c. It is exploited both for cobalt and arsenic. Cobaltine crystallises in the cubic system, and is also found massive, granular, and compact. Earthy cobalt has been imported in large quantities into England, from the United States. The ores of cobalt occur in many Cornish localities and other parts of Great Britain, but are chiefly obtained from Sweden and Norway, Saxony, Bohemia, the United States, and New Caledonia. Dr. C. Le Neve Foster describes* the ore worked at Skuterud, in Norway, as being found in certain bands of quartz-schist and mica-schist which contain small quantities of cobalt glance, cobaltiferous mispickel, iron pyrites and other metallic sulphides. Bands of mica-schist, with but very little of the ore, alternate with quartz-schist containing the bulk of the mineral, whilst here and there the quartzose zone becomes more foliated, accompanied by the development of mica and much cobalt. He remarks that quartz-schist is the rock most likely to be cobaltiferous, the mica-schist may also be worth working, but hornblende-schist is poor. The cobaltic "beds" are commonly from two to three fathoms wide.

In New Caledonia cobalt occurs as a hydrated oxide in connexion with the ferruginous clay pockets in serpentine previously adverted to, and without a trace of sulphur or arsenic. The proportion of cobalt obtained from this source is from 2 to 3 per cent. The mineral is also found in red clay in cavities of the Carboniferous Limestone as observed when treating of nickel.

Arsenic.—This and arsenical pyrites may be summarised as follows:—In Great Britain the official returns relating to arsenic refer to arsenious acid or white oxide of arsenic (crude and refined), much of which is a by-product obtained in preparing the tin and copper ores of Cornwall and Devon for the market. The arsenical pyrites is sold to works, principally in the same counties, for the manufacture of white arsenic. In the form of arsenical pyrites this metal is the close companion of tin ore, from which it is eventually separated by calcination.

The principal kinds of arsenic are as follows:—

1.—**Native Arsenic**, which occurs in a variety of forms, granular, massive, columnar, or stalactitic.

2.—**White Arsenic**, arsenious acid.

3.—**Orpiment**, the tersulphide (arsenic and sulphur), with about 61 per cent. of arsenic.

4.—**Realgar**, the bisulphide (arsenic and sulphur), with about 70 per cent. of arsenic.

Native arsenic is tin-white in colour, but rapidly tarnishes on exposure to air. It often contains antimony and very small proportions of other metals, occurring principally associated with lead and silver ores. It is found at Dolcoath and other mines in Cornwall. White arsenic is an example in nature of what is obtained in much greater quantities artificially. It is met with as fine crystals (very minute) or encrusting some other material, and results primarily from the decomposition of arsenical ores. The white arsenic of commerce is chiefly obtained from *mispickel* (arsenical iron pyrites), which sometimes occurs alone, but is more frequently found in association with copper, tin, and gold. Orpiment, or "golden paint," crystallises in the rhombic system, has a very perfect cleavage, and usually occurs foliated or massive. Its colour is citron; the mineral is soft enough to be cut with a knife, but is not malleable. This tersulphide is made artificially, by subliming white arsenic with sulphur, in which form it is used as a paint, being known as "King's yellow." Realgar crystallises in the monoclinic system, but occurs also in a massive condition. It is much deeper in tint than orpiment, and passes through orange to bright red; as the two minerals generally occur together in Nature, this distinction of colour is useful to discriminate one from the other. It may be noted that, on exposure to the atmosphere, realgar changes to orpiment. Like the last-mentioned mineral, it is prepared artificially, to be used as a pigment. The principal localities yielding realgar are Kapnik, in Transylvania; Felsobanya, in Hungary; Hall, in the Tyrol, and it also comes from Bohemia, Kurdistan, and China.

Bismuth.—This metal occurs as a sulphide, an earthy oxide, &c., but the ore from which the bismuth of commerce is obtained (or at least the bulk of it) is *Native Bismuth*, which crystallises in the hexagonal system, though it is

usually found massive or granular. Its colour is metallic white with a slight suspicion of pink; it tarnishes in the open air, and when cold is brittle. It is generally described as being sectile, but when heated is somewhat malleable. Commonly, even the pure metal contains traces of sulphur, arsenic, and tellurium. Native bismuth is found in association with the ores of lead, silver, zinc, and cobalt. In England the ores of this metal have been met with in Cornwall, at St. Just and St. Ives; also in Gwinear, Illogan, Redruth, and St. Austell. Mr. Symonds, in his work on the "Geology of Cornwall," p. 101, states that bismuth occurs sporadically in small pieces in the lodes of Restormel and Fowey Consols, in some mines near Calstock, and at Ivey Tor. It is not often met with in any great quantity in the county, though a few years since the two mines Wheal Owles and East Pool, were very productive. Another British locality is Caldecote Fells, in Cumberland. It is found in two or three districts in the United States, also in Chili, Sweden, Norway, Bohemia, Saxony, and Queensland. Bismuth is employed in several alloys, as, for example, solder.

Antimony.—This occurs in the native condition, but the principal ore from which the antimony of commerce is derived is *Sbinitz* (or *Antimonite*), sometimes called antimony glance and grey antimony. It is a tersulphide (antimony and sulphur), containing about 71 per cent. of antimony; crystallises in the rhombic system, but is commonly found as masses having a columnar structure. It is lead-grey in tint, is prone to become tarnished, and the latter is sometimes iridescent. In mass it is brittle, but thin leaf-like pieces are slightly flexible, and it is one of the most readily fusible minerals in Nature. There are two important oxides of antimony—viz., antimonious oxide and antimonim oxide. Antimony usually occurs in veins, which may be merely a few inches in thickness, or may attain to as much as 6 ft., as in York County, New Brunswick. At that locality the veinstone is white quartz, calcite and iron pyrites, and the ore raised contains from 10 to 12 per cent. of stibnite. No antimony ore was produced in the United Kingdom in the year 1893 (the last available returns), though in previous years small quantities were raised from veins in Scotland and North Cornwall. It is found at several places in Hungary, also in Spain, Borneo, and the United States. Ordinary commercial antimony is very impure, containing iron, arsenic, lead, and sulphur, and is termed "regulus of antimony." Amongst other things, it is extensively employed in alloys to harden them, in which form it is often used in building.

OBITUARY.

MR. G. KNOWLES.—Mr. George Knowles, of Hollin Hall, Moorhead, Shipley, died there on the 26th ult., after a short illness. Mr. Knowles was formerly in business in Birmingham as an architect and land agent, but retired many years ago. From 1852 to 1854 and from 1867 to 1869 he was a member of the Shipley Local Board.

GENERAL BUILDING NEWS.

TECHNICAL INSTITUTE, NORWOOD.—The Technical Education Board of the London County Council have taken over the Norwood Institute, Knights' Hill, S.E., and it will shortly be opened as a Technical Institute, on lines somewhat similar to the new Polytechnics in the Borough, Battersea, and elsewhere. The work of adapting the premises to the requirements of the governors has been entrusted to Mr. Leslie Waterhouse, M.A., Holborn.

MEAT MARKET, BIRMINGHAM.—The foundation-stone of the new meat market and slaughterhouses for Birmingham were laid on the 24th ult. The architects, says the *Birmingham Gazette*, Messrs. Essex, Nicol, & Goodman, have devoted special attention to the methods of our German neighbours, and the market will be built on the combined Continental and English systems. The tender of the builder, Mr. John Bowen, was for 30 cool, for building alone, and with the cost of the site, fittings, and incidental expenses, the outlay is estimated to be 92,000l., exclusive of the electric installation, machinery for pumping water, and refrigerating plant. The market has a frontage to Bradford-street of about 300 ft. It extends to Cheapside, where the width is exactly the same as at the front; whilst the depth between the two thoroughfares is about 300 ft. The wholesale market is on the Sherlock-street East side, and the wing to the left looking from Bradford-street is for retail dealers. On the meat market level are three retail slaughterhouses, wholesale slaughterhouses, pig lairs, tripperies, or offal-houses, cattle and sheep yards and gangways, and ample open space is left between each. The cattle and sheep-lairs are placed over the slaughterhouses;

the entrances, one on each side from the street adjoining, communicate direct by inclined ways from the entrance yards, and from the lairs to the pens in rear of the slaughterhouses by separate inclines. The slaughterhouses for calves and sheep are situated in the rear of that for beasts, and the arrangement is made whereby each allotment has a standing room for a butcher's cart in the roadway. The yard on the retail side is upon the present soil surface, and the subway under the meat market only a few feet below. The slaughterhouses for the wholesale butchers are so constructed as to give twenty separate houses divided by iron grillwork. Lairs for sheep and beasts for wholesale butchers are over the slaughterhouses and partly over the block of buildings adjoining Sherlock-street on the same level, and the approach is from Sherlock-street. The slaughter halls for retail butchers are placed so as to give as much air-space as is open working as possible. At the end of the meat market, adjoining Bradford-street, a small portion of the ground-floor area is occupied by the inspectors' and collectors' offices and stalls, and to the superintendent's office and official room. Outside the market adjoining those offices will be the carcass sheds, where there will be a complete overhead track from the slaughtering stalls to the market, about 2,000 yards in extent, with the necessary girders, brackets, and hangers, and fifty travelling jennies and hanging bars. Thirty-two cells have been built for washing entrails, eighty-four for the storage of meat, and there are a large number of dormitories, apart from the various articles required for slaughtering purposes, and in the transaction of the business of the market.

TECHNICAL SCHOOLS, RICHMOND.—On the 24th ult. the foundation-stone of the New Secondary School in Kew-road, Richmond, was laid. The building has as its object the provision of efficient modern instruction in science, art, and manual work during the day for 350 or 400 scholars, and to serve the purposes of a polytechnic, including women's classes, in the evenings. It will cost, when completed, 6,467l. The portion now being erected will cost 4,626l. Messrs. Fryer & Bath, of Westminster, are the architects. A description of the building appeared in our issue of June 12 last.

NEW OFFICES, AUSTIN FRARS.—The freehold property comprising Nos. 10, 11, and 64, Austin Friars, E.C., and covering an area of 5,000 ft. super., has been purchased by the Johannesburg Consolidated Investment Company. Mr. T. H. Smith, of Basinghall-street, has been instructed by the directors to prepare plans for the new building to be erected on the site for their occupation.

PUBLIC LIBRARY, THORNIEBANK, RENFREWSHIRE.—The memorial-stone of the public library which is being erected at Thorniebank to commemorate the late Mr. Alexander Crum was laid on the 27th ult. The reading-room of the library is 24 ft. by 48 ft., and is lighted on all sides by large windows, high enough to admit of a range of book-cases to accommodate 5,000 volumes being placed against the walls. Situated at the back is a book-store, which is capable of holding 3,500 volumes. Adjoining the book-store is a committee room. The building, which was designed by Dr. Rowand Anderson, Edinburgh, is in the Classical style.

BAPTIST CHAPEL, HORFIELD, GLOUCESTERSHIRE.—On the 24th ult. a new Baptist chapel, situated in Brynland-avenue, Horfield, was opened. The buildings include a school chapel, to seat 500 persons, class-rooms, vestry, and offices. The erection is of blue brick, with freestone dressings and ironing. The cost of all the buildings will be about 6,000l. The architect was Mr. H. J. Jones, of Bristol, and the contractors for the work at present in hand are Messrs. R. Wilkins & Sons.

CHURCH, NOTTINGHAM.—The Duke of New Castle on the 23rd ult. laid the foundation-stone of St. Catherine's Church, St. Ann's Well-road, Nottingham. The new church, which is being built to supersede the present iron structure, is to consist of a nave, of four bays in length, with north and south side aisles, a lofty chancel with morning chapel on the south side, an organ chamber, and clergy and choir vestries. The nave is to have a clerestory of more than usual height, with two wide light tracied windows to each bay. The west end has a wide doorway, with three two-light tracied windows over, and a St. Catharine wheel window in the gable. The church will be built of Bulwell stone, with Bath-stone dressings; the roofs are open timbered, with arched principals, supported on shafts with pinnacles. The GLAMORGANSHIRE. The building was opened on the 27th ult. In the basement is a club-room, 35 ft. by 35 ft., with committee-room and library adjoining. There are also a kitchen and the usual offices. On the ground floor, which is level with the road, is the public hall, capable of seating between 400 and 500 persons, with a platform and the staircase leading down to retiring-rooms in basement at one end. The hall is entered from the road by a large vestibule. The floor to the hall is of fireproof construction. The

* "Ore and Stone Mining," 1894, p. 27.

ation to the road is built in red brick, with Bath stone dressings. The gables are filled in with plaster work, with white plaster between. The whole of the work has been carried out by Messrs. Agnew Brothers, Manselton, Swansea, from the plans prepared by Messrs. Wilson & Moxham, architects, Swansea.

EDMUND'S PUBLIC LIBRARIES.—The plans for the first of the Thomas Nelson Hall and Public Libraries are now before the Dean of the Court. The site chosen is at the corner of the street and Murdoch-terrace, immediately opposite the new subway to Dalry. The plans show a building with frontage to Murdoch-street of two feet, and one story to Murdoch-terrace. There is a large vestibule and entrance-hall, on the right of which is the Nelson Hall, 75 ft. long by 33 ft. 6 in. In the centre is the lending library, with a counter to the inner entrance-hall for general books, and on the left the reading-room, 75 ft. long by 18 ft. wide, with boys' room behind. The Nelson Hall will be fitted up as a news and recreation room, and will be provided with newspapers and games. It will be separated from the library by a glass partition in five arches. The library will contain accommodation for from 12,000 to 20,000 volumes, with ample light from the roof, divided from the reading-room by a counter with a row of double columns and arches. The upper floor contains staff and committee rooms, and a large hall, with a row of double columns and timbered roofs, and the lighting is principally in large floor-lights. The architect is Mr. Harry Gray Taylor.

CHAPEL VESTRY, HORSFORTH, YORKSHIRE.—The foundation-stone of a new vestry for the new Wesleyan Chapel in Bachelors-lane, Horsforth, was recently laid. In addition to this new vestry, there are plans for the building of other parts of the chapel, plans for which have been drawn by Mr. n. Walker.

BUSINESS PREMISES, BIRMINGHAM.—It is proposed to erect on a piece of land situated in Corporation-street, Birmingham, having an area of 800 square yards, a frontage of 45 ft., and a depth of 45 ft., a large furniture factory and a show-room. The plans for the building are being prepared by Messrs. Crouch & Butler, Birmingham. The cost building will be about 10,000. A contract has been given to Messrs. Smith & Sons, Birmingham, the alteration of part of Mr. Dean's present premises in Corporation-street.

CHOIR-STALLS, &c., WESTON FAVEL CHURCH, NORTHAMPTONSHIRE.—The Bishop of the diocese recently dedicated the new choir-stalls and altar-decorations for St. Peter's Church, Weston Favel. The new choir-stalls and the prayer-desks are of oak, foreign pine being used for the more delicate portions, in English oak for the bases, floors, &c. The men's book-fronts and the front of the prayer-desks are all open tracery work, and the end uprights have been poppy-heads, finished in treatment. They have been made by Mr. John Westley, builder, a student of Weston Favel, the carving been executed by Mr. Samuel Reynolds, of Northampton, and the whole being from designs by Mr. M. H. Holding, of Northampton, the architect of the church restoration.

CHURCH, TREHARRIS, GLAMORGANSHIRE.—On 29th ult. the foundation-stone of a new church to be called St. Matthias—in Cardiff-road, Treharris, was laid. The new church, which will be used for accommodation for 365 worshippers, will be about 3,000 ft. It is to be built of native stone with Bath stone-dressings. Mr. J. L. Pearson, A. B., is the architect, and the contractors are Messrs. William Cowlin & Son, of Bristol. The work of the works is Mr. H. Cane. There will be a nave, a north aisle, a chancel, an organ-chamber, and two vestries, with an ornamental turret at the western end.

PROPOSED EXTENSION OF HARBORNE PARISH CHURCH.—It is proposed to enlarge this church, and the plans drawn up by Mr. Ralph Heaton provide for an extension of the chancel 14 ft. or 15 ft. eastward, and the extension of the outer walls 10 ft. or 11 ft. The choir will thus be accommodated in the chancel, and the space in the nave will be increased so as to permit of seating accommodation for 850 persons in that portion of the church. The galleries are, according to the plans, to be dispensed with. The estimated cost of the scheme is stated to be 4,000, or, if only the extension of the chancel be entertained, 1,250.

COFFEE TAVERN, BURNHAM, SOMERSET.—The contract has been let for the erection of a new coffee tavern at Burnham, Somerset, for Mr. B. Braithwaite, jun., on the site of the "Lion's Arms Hotel." The premises will comprise a large coffee bar, bar parlour, manager's office, accommodation for daily visitors, cyclists, football teams, &c., also a suite of rooms for the local Liberal Association. Messrs. Clark & Mosely, of Darlington, are the architects, and Mr. James Keats, of Burnham, the contractor, who will carry out the work under the local superintendence of Mr. C. S. Leach, architect, of Burnham and Gbridge. The walling will be built of bricks made by the Apex Tile Company, with Cornish stone dressings, and the roof of Staffordshire Broseley

NEW BUILDINGS, ST. EDMUND'S COLLEGE, RTFORD.—On the 23rd ult. the foundation-stone

was laid of the new buildings that the authorities wish to add to the St. Edmund's College. When complete the new buildings will include an exhibition-hall, which will be used during the year for one of the studies, ten class-rooms, lavatories, swimming-bath, covered playground, two dormitories, a library for the boys, and a billiard-room for the professors. The architect is Mr. A. E. Purdie. It is not intended to carry out at once the whole scheme. The part to be immediately proceeded with, of which the estimated cost is 4,500, will comprise the swimming-bath, lavatories, a dormitory to hold forty boys, and, if funds permit, additional class-rooms and a boy's library.

SCHOOLS, TENBURY, WORCESTER.—The Bishop of Hereford visited Lindridge, near Tenbury, a short time since, for the purpose of opening the new church schools. Messrs. Hewitt & Sons, Tenbury, were the builders, Mr. J. T. Meredith, of Kidderminster, being the architect. It is built of red brick and white brick facings, and stone coping surmounted by a tiled roof. It comprises a mixed schoolroom and class-room, which can be divided into two or thrown into one by means of folding partitions, and an infant school. The whole school is capable of holding about 150. It is heated throughout with hot-water pipes. A clock spire forms part of the scheme.—After leaving Lindridge, the Bishop of Hereford visited Tenbury, where he laid the foundation-stone of the new infant school. Its construction is in the hands of Messrs. H. Hewitt & Sons, builders, Tenbury, the architect being Mr. J. T. Meredith, Kidderminster. The school will accommodate about 150, the size of the principal schoolroom being 33 ft. by 21 ft., and 17 ft. high, while that of the babies' room will be 21 ft. by 18 ft.

UNNVALESCENT HOME, LLANFAIRFACH, NORTH WALES.—A convalescent home is shortly to be erected at Llanfairfach, North Wales. The building will contain fifty beds. Messrs. Bower & Hall, of Nantwich, are the architects, and the contract has been let to Mr. J. Gallimore, of Newcastle. The building will be erected of blue Penmaenmawr stone, with freestone dressings. On one side the building ground gives the building a basement level. The building will be 130 ft. long, with a depth of 45 ft. The basement will contain dining-hall, coming out level with the garden, kitchen, bagatelle-room, scullery, and domestic offices. The ground floor comprises sitting-rooms, library, surgery, and matron's room. The upper floors will be occupied as dormitories and servants' quarters. Laundry and stables will be attached.

ALTERATIONS TO MUSIC HALL, BRISTOL.—After undergoing extensive alterations and redecoration, the old Star Music-hall in Broadmead, Bristol, was reopened on the 29th ult., as the New Tivoli. Mr. Hancock was the architect engaged.

BOARD SCHOOLS, FARNHAM.—The new Bourne Schools have recently been opened, Mr. Paxton Watson was the architect of the school. Messrs. Bottrill & Son, of Reading, being the builders.

SANITARY AND ENGINEERING NEWS.

PENZANCE SEA-WALL.—A special meeting of the Penzance Town Council was held in the Council Chamber on the 15th ult., for the purpose of opening the tenders for the new sea-wall on the Western Promenade. The Mayor read the tenders as follows:—John Shaddock, Muller, Plymouth, 13,500; Shillaber, Plymouth, 10,200; Messrs. J. C. & T. A. Lang, Liskeard, 10,600; Arthur Carkeek, Redruth, 9,860; W. H. Stevens, Penzance, 11,075 (subject to a clause that the conditions in the contract deed shall meet with the contractor's approval). The Surveyor's estimate was 10,800, including cost of the inquiry and the railings. Mr. A. Carkeek's tender was accepted.

WATER-SUPPLY, NORTH WALSHAM, NORFOLK.—Mr. J. C. Mellis, C.E., has been instructed by the North Walsham District Council to examine and report in reference to a water-supply for their district.

MISCELLANEOUS.

A NEW BUILDERS' LEVEL.—Messrs. Ryan Bros., builders, of Clapham Junction, send us the specification of a simple improvement in a builder's square, whereby it can be used to give perpendicular or raking levels. A spirit level is attached to the short arm of the square, and on the long arm is fixed an extra or double arm, hinged on a pivot at the top, and with a metal quadrant at the top, formed to the arc of the circle through which the movable arm passes, and capable of being clamped at any desired point by a screw. Thus, if the object is to keep the true line of batter in a wall or a mansard roof, or any other surface, the movable arm can be clamped to that angle and the level on the horizontal arm will give the right angle of the movable clamped arm on the upright portion.

ART SCHOOLS AND EXHIBITIONS.—In the official circular for July of the *London Technical Education Gazette*, it is stated that last year the Technical Education Board offered twenty Schools of Art Scholarships, twenty Artisan Art Scholarships, and 200 Evening Art Exhibitions, but as there was not a sufficiently strong competition, the Board did not award the full number. This year there has been a much keener competition, and a

new feature has been introduced by the decision to award a certain proportion of the scholarships and exhibitions, not exceeding one-half, on the merits of works submitted by the candidates, apart from the results of examination. The result has been a marked improvement in the competitions. There is evidence to show that the opportunity afforded to candidates of submitting works of their own for competition has produced a marked improvement in the work done in the schools. The following report by Messrs. Frampton and Lethaby, the Board's Art Inspectors, is also given in the official circular:—"We have seen much of the work done in examination last year, and this year's work shows a marked all-round improvement; 526 competed as against 244 last year. The work done at the examinations is much fresher, showing more self-reliance on the part of the students in getting away from stereotyped methods of drawing and design, and thinking for themselves. It is this personal touch, this observation at first hand, that has been one of the chief guides to us in marking the papers we have examined. Under the class of works submitted, the results have been even more satisfactory than in the set examinations, and most excellent work has been submitted where design and workmanship have been brought together by one worker—in many cases an apprentice or journeyman. The list of occupations of the students recommended for scholarships on the merits of works submitted shows that this is by far the best way not only of obtaining the most real and interesting work, but of reaching those actually engaged in the crafts. For instance, there were original book-bindings by a bookbinder, metal-work by metal-workers and jewellers, the work of stone and wood carvers, of a die-sinker, engraver, and lithographer, and an embroidery by a dressmaker, &c., &c. One of the most interesting contributions has been the embroidery sent from Battersea Polytechnic, where an attempt has been successfully made to bring design and work together in the embroidery class. At this school design is not so much taught by the masters as a set of rules, but is drawn out by suggestions. We shall hope to see work from Battersea equally successful in other departments, such as wood-carving. In the class of preparatory studies much good work was also submitted, showing that the students had been induced to make careful studies outside the bounds of mere school work."

SHOREDITCH MUNICIPAL TECHNICAL SCHOOL.—The following list has been sent to us of candidates who have passed examinations and competitions, all being pupils of the above-named school:—London County Council Artisans Scholarship (value 20s. a year)—S. H. Stilwell, marquetry cutter; A. Gardner, chair carver; London County Council Evening Art Scholarship (value 5s. a year)—F. Tod, woodcarver; The Worshipful Company of Carpenters' Examination in Carpentry and Joinery—Student S. Switzer entered and gained First Class Certificate and Bronze Medal; City and Guilds of London Institute Examinations in Cabinet-making—ten entered, eight passed; 1st Class, F. Bransgrove, C. H. Dickinson, S. Barron, F. W. Ockelford, G. H. Godden; 2nd Class, A. J. Jackson, W. S. Woodhouse, F. P. Hamilton; Theoretical Plumbing—ten entered, five passed; 1st Class, F. C. Painter, J. E. Higgs, A. Shephard; 2nd Class, J. E. Abbott, J. A. Clark; Practical Plumbing—F. C. Painter, J. E. Higgs, F. W. Mudd; Electrical Fitting—four entered, two passed; S. Pauls, F. J. Benkert; Elementary Teachers' Manual Training (Woodwork)—first year; twelve entered, twelve passed; 1st Class, F. C. Letch, S. A. Switzer, W. S. Pincott, J. Benson, F. R. Frost, S. T. Bryan, J. E. Murray, H. H. Harrop, A. J. White, E. W. Switzer, F. S. Wheeler, T. K. Warry; Final Examination (Woodwork)—six entered, six passed; 1st Class, J. J. Boyle, T. Graves, N. C. Hambrook, H. Price, W. T. Stokes; and Class, B. H. Emerson.

CITY AND GUILDS OF LONDON INSTITUTE.—The diploma of "Associate of the City and Guilds of London Institute" has been conferred by the Council of the Institute upon the following matriculated students who have this year successfully completed the full course of instruction at the Central Technical College. In Civil and Mechanical Engineering:—H. S. Andrews; F. G. Arnold; J. E. Chapman; H. E. Fenwick; C. S. Hainworth; E. W. Hainworth; B. H. M. Hewitt; E. W. Hummel; E. L. W. Lewis; F. E. E. In Applied Physics and Electrical Engineering:—J. M. Barr; S. Beeton; C. Brandeis; W. M. Carver; A. D. Constable; S. Gilford; F. S. Crogan; A. C. Hanson; G. S. Hewitt; C. D. Le Maistre; P. G. Phelps; W. Reilly; W. Roberts; H. G. Solomon; R. J. J. Swann; C. P. Taylor; E. L. Thorp; E. L. Webb; N. J. Wilson.

OFFENSIVE SMELLS.—In his monthly report on the sanitary condition of Kensington, Dr. Ernie Duffield, the Medical Officer of Health, says that:—"The long-continued dry weather, combined with the heat, accounts for the numerous complaints recently received of offensive smells from street gulleys and wood-paved roads. This matter has been considered by the Sanitary Committee, whose recommendation that the Wharves and Plant Committee be requested to instruct the Surveyor to take all necessary steps for a more frequent cleansing of the gulleys and the wood-paved roads, was adopted by your Vestry. Pungent as may be the odour

arising from the roads paved with creosoted wood blocks, there can be no doubt that it is less objectionable than the smells arising from roads paved with non-creosoted wood blocks, which are harmless. The nuisance from practically untrapped gulleys (and these, I fear, are a majority in this parish), is more dangerous and ought not to be tolerated. Nor would it exist if Sanitary Authorities complied with the requirements of Section 71 of the Metropolis Management Act, 1885, which reads as follows:—"Every District Board and Vestry shall, by providing proper traps or other coverings, or by ventilation, or by such other ways and means as shall be practicable for that purpose, prevent the effluvia of sewers from exhaling through gulleys, gratings, and other openings of sewers in any of the streets or other places within their district or parish."

NEW R.A. ELECTIONS.—Mr. E. Onslow Ford, A.R.A., and Mr. W. B. Richmond, A.R.A., were elected Royal Academicians on the 26th ult.

CHURCHYARD BOTTOM WOOD, HIGHGATE.—The agitation in favour of the acquisition of Churchyard Bottom Wood, Highgate, has resulted in the Ecclesiastical Commissioners, who own it, making a considerable concession. They will sell the wood (sixty-five acres) to the District Council for 25,000*l.*, and waive their right to cut two roads through it. By this the rural character of the wood is preserved, and the Charity Commissioners, who are going to complete their scheme by selling the front for building purposes, will gain another 50 ft. frontage, and enable two more houses to be erected upon the land, and thus another 20*l.* a year will be added to the prospective income of the charities.—*Daily Chronicle*.

LITHOGRAPHIC EXHIBITION IN PARIS.—A century exhibition of lithography is to be held in September and October next in the Palais des Beaux Arts, on the Champ de Mars.

MIDDLESBROUGH BUILDERS AND THE CORPORATION.—At a meeting of the Middlesbrough Streets Committee, held on the 26th ult., Alderman Bulmer presiding—four builders, Messrs. H. Dean, Wilkinson, Lister, and Ward, were asked to explain why they had deviated from the plans previously passed by the committee by adding attics. They admitted that they had made the alteration without the sanction of the committee, but said they thought they were improving the property. The Chairman informed them that the Corporation must not be set at defiance, and no building must be erected except in accordance with the plans as passed by the committee. After some discussion, it was decided to pass the amended plans where the attics were marked as boxrooms, and reject those marked as bedrooms.

A CHATEAU BURNED.—A serious fire has nearly destroyed the Château de Roverdi, near Roubaix, in France, which contained a splendid collection of pictures, valued at 500,000 francs, including some works by Van Dyck and Rubens.

REPAIRS TO HAMPTON COURT PALACE.—During the past few days several men have been engaged in repairing the stonework of the Great Hall, Hampton Court Palace, which had become somewhat dilapidated in parts.

NEW ROPE RAILWAY IN PARIS.—The preliminary work is to be commenced shortly for a rope traction railway with a double line of rails, from the Boulevard des Filles du Calvaire, near the Cirque d'Hiver, to the highest part of Montmartre, near the Rue des Pyrenées.

THE STATE OF THE NEW YORK CUSTOM-HOUSE.—Attention has been called by the health authorities to the unsanitary condition of the Custom-House in New York. The report of Sanitary Inspector Sullivan shows it to be in a most deplorable condition, endangering greatly the life and health of the employees in this department. The report was submitted to Collector Kilbreth, who forwarded it to the Treasury Department, but states that he has received no communication regarding it as yet. According to the report of Inspector Sullivan, the drain-pipes in the Custom-House are connected in such a way with the pipes which supply drinking-water that there is danger of the latter being contaminated. Contamination superadded to the sufficiency already in Croton water would seem to promise the Health Department good reason for summary interference in the near future. The details of Inspector Sullivan's report make a chronicle too loathsome to publish.—*Architecture and Building*.

NEW RAILWAYS IN FRANCE.—Two new lines of railway are to be commenced shortly, one from St. Quentin to Catlet, the other from Bordeaux to the Spanish frontier. A branch line from the last-named will be made from Bayonne to St. Jean Pied-de-Port, with a coast-station at Bayonne.

THE WATER SUPPLY OF CALCUTTA.—The *Indian Engineer* (a paper which we are glad to see, has considerably extended its size and scope as compared with its earlier numbers) states that, "With all the regard that is had to the filtering and otherwise purifying of the Calcutta water-supply, the inhabitants of that delectable city are frequently rendered nervous, or nervous, by such things as hairy (i) snakes entering up the 32-cm. *Aqueducts* from the taps or the street hydrants, but it has been reserved for Messrs. Smith, Stanistreet, & Co., a well-known firm of chemists in Calcutta, to prove

that the water is anything but pure; they have lately fitted up a large installation of the 'Berkefeld' filters for use in the manufacture of their aerated waters, and the amount of impurity extracted by it daily from their water-supply is said to be astonishing. So that Calcutta is losing its reputation more rapidly than ever. It is, perhaps, not insignificant that we read in another column of the same journal that, while Calcutta has been passing through an unusually unhealthy season, rural Bengal has shown better health statistics than usual. Something is evidently wrong in Calcutta.

BRITISH MEDICAL ASSOCIATION ANNUAL MEETING.—In connexion with the British Medical Association's annual meeting, which is being held this week, a series of receptions have been given at the Parkes Museum by the President and Council of the Sanitary Institute, and on Wednesday Dr. Wynter Blyth delivered a lecture on "The Teaching of Hygiene as illustrated by the Parkes Museum." A short report of the lecture will appear in our next issue, as well as a brief report of subsequent proceedings.

ELECTRIC LIGHT FOR HACKNEY.—The Hackney Vestry have decided to introduce into their district the electric light in conjunction with a dust-destructor. The scheme has been entrusted to Mr. Francis Hastings Medhurst, the consulting electrical engineer to the Vestry.

LEGAL.

PARTY WALLS AND THE LONDON BUILDING ACT, 1894.

IMPORTANT CASE IN THE COURT OF APPEAL.—The case of *Crow v. Redhouse* came before the Court of Appeal composed of the Master of the Rolls and Lords Justices Kay and A. L. Smith, on Monday and Tuesday last, it being the appeal of Mr. Arthur Crow, District Surveyor of the Whitechapel-Spitafields District, against the decision of a Divisional Court of Queen's Bench, consisting of Mr. Justice Wills and Mr. Justice Wright, on a special case stated by Mr. Dickinson, a metropolitan magistrate on an appeal by Mr. Samuel Redhouse, under Section 150 of the London Building Act, 1894, against a decision by Mr. Crow. The case was fully reported in the *Builder* for July 13, last.

The facts of the case are shortly these:—Mr. Redhouse proposed to rebuild a six-story warehouse, No. 3, Church-street, which in consequence of a fire and subsequent proceedings was taken down as dangerous in November, 1894, for more than one-half of its cubical extent, so that the proposed rebuilding would be a "new building" within Section 5 (6) of the London Building Act, 1894, which defines new building as "any building which has been taken down for more than one-half of its cubical extent, and re-erected, or commenced to be re-erected, wholly or partially, on the same site after the commencement of this Act." The District Surveyor served a notice of objection on Redhouse, but the matters in the notice were remedied, with the exception of the objections made to the use, without thickening, of a wall, forming the west boundary of the site, as the party-wall between the reinstated building, No. 3, Church-street, and the adjoining warehouse, No. 1, Church-street, the said wall not being in conformity with the provisions of the Act as to new party-walls. Before the fire took place the party-wall had been the party-wall between No. 1 and No. 3. So far as the party-wall concerned No. 1, which had not been seriously injured by the fire, it had been reinstated in the course of the reinstatement of No. 1. These reinstatements had not amounted to the erection of a "new building" at No. 1. Redhouse appealed to the magistrate on the ground that he was not compelled by law, to make the party-wall conform to the provisions of the Act of 1894. The extent to which the party-wall had been burnt and taken down in consequence of the fire amounted to only one-third of its superficial area, and the remainder was safe. The party-wall had been erected in conformity with the previous Building Acts, but was not of the thickness required by the Act of 1894. Redhouse's contention to the Magistrate was that, as the party-wall had not been taken down, burnt, or destroyed, to the extent of one-half thereof, by virtue of Section 208 of the London Building Act, 1894, the proposed use of him of the party-wall was not in contravention of the Act. The Section in question enacts that, "Unless in any case the Council otherwise allow, when a party-wall or external wall not in conformity with this Act has been taken down, burnt or destroyed, to the extent of one-half thereof (measured in superficial feet), every remaining portion of the old wall not in conformity with this Act shall either be made to conform therewith or be taken down before the rebuilding thereof." The surveyor, Mr. Crow, contended that the proposed re-erection, being a "new building" within Section 5 (6) of the Act, the party-wall should be so erected as to comply with the provisions of the said Act, and that there was no exemption enacted or implied in Section 208. The Magistrate decided in favour of Redhouse, and held that he could not be compelled to take down, rebuild, or thicken the said party-wall, and the Divisional Court upheld his decision, Mr. Justice Wright, the junior Judge, dissenting, and withdrawing his judgment.

Mr. Crow now appealed.

After hearing the arguments of counsel, the Lordships dismissed the appeal with costs.

A SANITARY PROSECUTION.

GAMMELL v. J. TAYLOR.

At the Handsworth Police-court, on the 26th ult. John Taylor, Heathfield-road, was summoned at the instance of Mr. Gammell, Inspector of Nuisance, the Urban District of Perry Barr, for neglecting to comply with an order made on June 14, requiring him within seven days, to cleanse and properly remove the contents of a dumb well on the premises Chester-road, Oscott.

Mr. Henry Ward, Clerk to the Perry Barr District Council, informed the Bench that the defendant had made an attempt to cleanse the well, which was 80 ft. deep, but as the work was being carried on in such a way as to prove dangerous to health, he stopped the contractor from proceeding with it. Mr. Haction, for the defendant, said his client had done his best to comply with the order. No further action was given to the defendant from the day the work was stopped until the second summons was issued that the former order had not been complied with.—The case was adjourned for a fortnight to enable the defendant to cleanse the well and remove the refuse properly.

WRIGHT & CO. v. HENNESSEY.

In the Queen's Bench Division, on the 26th ult. before Mr. Baron Pollock and a special jury, the case of *Wright & Co. v. Hennessey* was tried. It was an action for damages for breach of contract brought by Messrs. Samuel Wright & Co., of the Crown Works, Amhurst-road, Hackney, fibro-plaster manufacturers, against Mr. Daniel Hennessey, of Club Union-buildings, Clerkenwell-road, the organising secretary of the National Association of Operative Plasterers, for (1) damages for maliciously inducing and endeavouring to induce persons to break contracts with the plaintiffs, and for (2) an injunction restraining the defendant from inducing or endeavouring to induce Messrs. Colls & Sons to break a contract made by them with the plaintiffs in respect of work at the Pavilion Theatre, Whitechapel; (3) an injunction restraining the defendant from continuing to write or publish the libels complained of.

Mr. Lawson Walton, Q.C., Mr. T. W. Chitty, and Mr. Frank Newbolt appeared for the plaintiffs, Mr. Robson, Q.C., and Mr. A. H. Ruegg, Q.C., for the defendant.

Mr. Lawson Walton, Q.C., in opening the case, said that the defendant had attempted to ruin the plaintiffs by malignant libels and interference with the plaintiffs' contracts. The action was brought by the plaintiffs, not as an attack on trade unionism, but in self-defence. Mr. Samuel Wright, a member of the plaintiff firm, formed a combination of master plasterers. Mr. Peek, a master plasterer, and a difference with the defendant, and the men who were working for him were withdrawn. Wright and Peek some men, and thereupon persecution followed. The plaintiffs' names were inserted in a "black list" by the defendant's society. Several letters which had been sent by defendant to various contractors who had employed Wright were read in evidence, which showed that the defendant was endeavouring to persuade the contractors to dismiss the plaintiff. In June 1894, the plaintiffs entered into a contract with Messrs. Watkins & Company to supply and fix certain fibrous plaster work at South Kensington. Thereupon, a deputation headed by the defendant waited upon them, and the result was that Messrs. Watkins were compelled to discharge the plaintiffs.

Mr. Charles Watkins, surveyor and estate manager, was called and examined by Mr. Chitty, and said:—In June, 1893, I instructed the plaintiff to do work at 1, Cottessmore-gardens, South Kensington. The work was started, when I received an intimation from Doyley & Co. I wrote that the plasterers must leave in September, and the defendant called at my office. He said unless I fell into line with other builders they would be obliged to call out the union men. The defendant called again on the following Saturday. I went to the works and found the men on strike. I saw the defendant and others. I wrote to Wright's men saying I could not allow Wright to finish the work. James Marchant, examined by Mr. J. W. Chitty, said:—I was fixing work for Wright & Co. in January, 1893. The defendant told me they were determined to smash Mr. Wright, if it cost them £6,000 and that they had got that amount in hand.

Cross-examined by Mr. Ruegg, Wright paid the same as other men for his piece-work.

Mr. Peter, foreman to Patman & Fotheringham, said that the defendant told him the plaintiffs were scamping their work by not fixing the slabs with screws. His objection was unfounded. Mr. J. H. Colls, builder, of Coleman-street, who was employed at the Pavilion Theatre, Whitechapel, and whose firm, Messrs. Colls & Sons, entered into a contract with the plaintiff firm for the plastering there, said that Mr. Wright's men did their work well, and he did not find that good men would not go near Wright's men.

On cross-examination the witness said that the contract with Wright had to be broken because all the union men were withdrawn, and Mr. Runtz, the architect, was anxious that the work should go on.

(the witness) refused to enter into a conspiracy with Wright.

Other evidence for the prosecution of a similar nature having been called.

Mr. Robson, Q.C., in opening the case for the defendant, said he quite admitted the right of the master to make any contract he liked. These men were, "We disapprove of certain employers." Any man had a right to say, "I won't work for that master, and I won't have anything to do with any man who aids that master." If any section of men took up an unreasonable position society would inevitably protect itself against such conduct. A man had a right over his own labour, and a right over the labour of others where he was not guilty of malice. Throughout this case there was absolutely evidence of malice. Mr. Hennessey was never "I have a contract which you are seeking to break."

Hennessey, the defendant, was then examined by Mr. Robson, Q.C., and said:—"I am organising secretary of the National Association of Operative Plasterers. If a dispute arises between masters and men I go and see what it really is. It is before the committee, and they advise me whether it is necessary to take action or whether they will let it go on as it is. I never had any complaint made by Messrs. Maxwell & Co. September 8 I went to Mr. Watkins with Mr. Verdon, and told him that his notice that he would only pay me on Thursday night was causing friction. Wright's name was never mentioned. Watkins said he should do as he liked. After that there was a strike. Watkins then changed his mind. I did not know when that Wright was employed by Messrs. Maxwell & Co. I was not aware that he was continually employing men and not paying them what we considered the trade union rate of wages."

Cross-examined by Mr. Lawson, Q.C.—I ordered Wright as an unfair employer. My business was to control the dispute. To get rid of Wright was the speediest way of settling the dispute. On my point of view it would be the happiest arrangement that Wright should go and our men should go. I object to Wright employing labourers to do masters' work. Mr. Watkins voluntarily offered to employ our men instead of Wright's men.

Mr. Botright, examined by Mr. Robson, Q.C., said,—"I am a plasterer. I have worked for Wright. He usual rate is 95d., he paid 9d. I worked over him and got nothing for it."

Cross-examined by Mr. Walton, Q.C.—I am a file plasterer. Wright said I was not a plasterer. This was the case for the defence.

Counsel on both sides having addressed the jury, Mr. Baron Pollock, in summing up, said that the question of action was of modern origin and had not been hitherto come very much into the courts. No man had a right to do that which injured another man less by acts he had a legal right to do. In this instance every one had a right to express his opinion freely with reference to the questions of the day. If an individual, in order to enforce his particular views, did an act knowingly and intentionally to inflict an injury upon another, the law did not allow that to be done. Nor could a man say, "If you don't employ a certain class of people we shall do certain things which will hurt you in your business." The question was, did the defendant say to himself, "I will go to these people and will write such letters as will induce any person or persons to break contracts with me or hereafter to be made with the plaintiffs. I will exercise my free will of my own." His Lordship asked the following questions to the jury:—"Do you think that the course of conduct pursued by the defendant with regard to the employment of the plaintiff Wright was improper in the sense of being malicious—i.e., with the intention of injuring him?" Do you think that the letters which were written and re-written with an improper motive to injure the plaintiff, or were written bona fide and with the best intention of discharging a duty?

The jury found that there was malice on the part of the defendant in the sense in which His Lordship used the word "malicious," and they returned a verdict of 5,000 damages for the libels and 3000, including the breach of contract. His Lordship gave judgment accordingly, and granted an injunction restraining the defendant from inducing or endeavouring to induce, Messrs. Collinsons from breaking their contract with the plaintiffs in respect of work at the Pavilion Theatre, Whitechapel, and from inducing or endeavouring to induce any person or persons to break contracts with the plaintiffs or hereafter to be made with the plaintiffs. His Lordship also granted an injunction restraining the defendant from continuing to write or publish the libels complained of. A stay of execution was granted upon the terms of the defendant paying 5000, into Court within a week.

MEETINGS.

SATURDAY, AUGUST 3.
Liverpool Engineering Society.—Visit to the site of the Elan Water Supply of the Birmingham Corporation. Chayder, Radnorshire.

MONDAY, AUGUST 5.

A. Camera Club.—Visit to Igham Moat, near Ennocks.

WEDNESDAY, AUGUST 7.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

15,390.—WATER-CLOSERS: *C. Elphick.*—This patent pertains to water-closers in which the pan is emptied by syphoning, and deals with means for preventing the syphonic action being set up by emptying liquids into the basin. To effect this a pipe is used which connects the top of the syphon with the open air. The pipe is normally open, but is closed by a water-seal when the flush is started.

15,390.—WINDOWS: *W. Nicol.*—For enabling sash-surplus to be detached and swivelled within apartments of buildings. Plates are, according to this invention, secured near the upper and lower ends of one side of the lower sliding-sash frame. These plates have projecting flanges, which enter recessed or sloated plates screwed to the butten-rod opposite. The sash-cord on the side opposite to which these fittings are applied is made detachable, so that the sash may be swivelled out at right-angles, and held in position by the projecting pieces fitting into the slotted plates.

15,799.—GLASS: *W. Pilkington.*—Relates to the production of corrugated sheet-glass. The heated glass-sheet is laid on a corrugated table, and is worked into shape by a roller passing over it.

22,365.—PAINT-POTS: *C. Corrigan.*—Relates to a paint-pot provided with a detachable bar, or strip, for removing surplus paint from the brush. The pot has three or more spiked feet for holding it steady when in use.

23,211.—WINDOWS: *W. Cruickshank.*—Refers to a method of making windows so as to allow the sashes to be drawn, which have also a binding or casement action. Each sash is furnished near the top and bottom with pintles which connect, with eyes suitably fitted, to the sash-frame. To permit of the sash swinging inwards, one of the vertical stiles is made in two parts, a portion being detachable from the sash and connected to the pulley-cord. The sashes connect by means of catches to the divided portion, and slide with the same, when raised or lowered.

9,956.—ROOFING-TILES: *K. Schelke.*—Deals with roofing-tiles so constructed that rain-water is conducted away without washing over their joints. Each tile has a lip or flange at its edges, and the connection of one tile with another is made by means of a fillet and groove arrangement.

NEW APPLICATIONS FOR LETTERS PATENT.

JULY 15.—13,571. A. Anderson, Bakers' Ovens.

JULY 16.—13,567. W. Webb, Combination Latch for Doors and Gates.

JULY 17.—13,567. P. Bruns, Roofing Tiles.

JULY 18.—13,571. J. Macdonald, Oil Lamps for Removing Paint.

JULY 19.—13,588. H. Vick, Construction of Water-closers.

PROVISIONAL SPECIFICATIONS ACCEPTED.

12,051. A. Franklin, Securing door-handles.

12,052. D. Radcliffe and T. Burrows, Water-pipes of lead or the like, to prevent same bursting through freezing.

12,053. W. Thomas, Wood screw for fastening the hinges of buildings or other structures.

12,054. W. M. Intosh, Windows and their frames.

12,055. J. Rusling, Construction and arrangement of dwelling-houses and in the apparatus therefor.

12,056. C. J. Bosham, Ventilators or air extractors.

12,057. M. Butcher and A. Cameron, Window-sash apparatus.

12,058. W. Nicol, Ventilators.

12,059. J. MacLaughlin, Bricks, blocks, tiles, &c., for building and paving.

12,060. K.—13,004. H. Heinzeling, Window-sash holder.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

11,382. W. Bailey, Machinery for bevelling glass.

12,592. W. Crombie and the Paragon Bolt Syndicate, Limited, Mortice-locks.

12,593. W. Whittey, J. Spinnery, A duplex syphon box.

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Frien-pk., Finchley, f., e.r. 401, 430; 76, Aberdeen-rd., Highbury, ut. 33 yrs., g.r. 101, 105, e.r. 804, 600.—By

Widdington, Phillips, & Page 39, Hampden-rd., Holloway, f., and a f.g.r. of 31. 10s., reversion in 69 yrs., 345d.; 41, 43, 49, 53, 59 and 61, Fleet-rd., Hampstead, ut. 33 yrs., g.r. 441, r. 360, 60, 1,373d.; 12, Egbert-st., Regent's-pk., ut. 69 yrs., g.r. 74, r. 401, 350d.; 27 and 28, Addington-sq., Camberwell, ut. 10 yrs., g.r. 204, r. 761, 851; 216 to 226 even, York-rd., Battersea, ut. 10 yrs., g.r. 14 yrs., g.r. 215, 1790d.—By *Stimmon & Sons*, 91 and 99, London Wall, City of London, ut. 4 yrs., g.r. 295d., r. 590d., 485d.; 42, New North-rd., Hoxton, ut. 40 yrs., g.r. 74, 105, r. 911, 360d.; 10, Quadrant-rd., Islington, ut. 30 yrs., g.r. 81, r. 352, 490d.; 10, Queen Elizabeth's Walk, Stoke Newington, ut. 44 yrs., g.r. 61, 65, r. 351, 400d.; 4, East Dulwich-rd., Peckham, ut. 24 yrs., g.r. 121, 105, r. 491, 105, 360d.; 53 and 54, Frith-st., Shaftesbury-av., f., r. 125d., 3735d.; 4, Charlwood-rd., Putney, ut. 914 yrs., g.r. 861, r. 351, 200d.; 363, Goldhawk-rd., Hammersmith, ut. 302 yrs., g.r. 41, 105, r. 351, 200d.; 37, Brecon-rd., Fulham, ut. 93 yrs., g.r. 41, 205d.; 3, Catlin-st., Old Kent-rd., ut. 513 yrs., g.r. 41, 200d.—By *Farbrother, Ellis, Clark, & Co.*, "Craigie," Manor-rd., Teddington, f., r. 401, 485d.; "Dawick," Manor-rd., f., r. 401, 490d.; 6 and 8, Winchester-st., Mimico, ut. 42 yrs., g.r. 171, r. 105, 655d.—By *Wheeler & Son* (at Chelsea): 1, Alfred-pl., West, South Kensington, ut. 332 yrs., g.r. 101, r. 95d., 1,300d.

JULY 19.—By *A. Barton*: 5, Westmoreland-st., Fimlico, ut. 341 yrs., g.r. 101, r. 651, 595d.; 20, Sutherland-st., ut. 304 yrs., g.r. 81, r. 841, 105d.; 18 and 19, Glen-cester-st., Lambeth, ut. 65 yrs., g.r. 61, r. 651, 505d.—By *F. J. Biley & Sons*: 107, 109, 111, and 113, Lancaster-rd., Notting Hill, ut. 51 yrs., g.r. 204, r. 1701, 1,520d.; 20, 22, 24, 26, 28, 30, 32, and 36, Flockhouse-rd., Edmonton, ut. 91 yrs., g.r. 251, 145, 6d.; 53 to 67 odd, Lavender-rd., ut. 91 yrs., g.r. 221, 181; 93 and 95, Breitenhard-rd., ut. 90 yrs., g.r. 61, 65, 125d., 127, 129, 131, and 133, Breitenhard-rd., ut. 91 yrs., g.r. 121, 151, 105d.; 48 and 49, Whitfield-rd., Plashet, ut. 88 yrs., g.r. 71, 215d.—By *Walter Hall*: 42, 44, and 46, Allen-rd., Stoke Newington, ut. 58 yrs., g.r. 154, r. 811, 500d.; 26, 28, 34, 4, Hem-stall-rd., Hampstead, ut. 95 yrs., g.r. 351, 200d., 1,050d.—By *Norton, Trist, & Culbert*: "Seymour Lodge," Sydenham Hill-rd., Sydenham, f., and 1, a. 2. r. 1,605d.; "New Lodge," Charles-st., and 2, a. 3. r. 21, 20, and 1, 90d., 1,800d.; 1, 9, 19, and 21, Charles-st., f., r. 531, 451, 500d.; "Gothic Lodge," Charles-st., and "Percy Lodge," f., r. 611, 880d.; 46 and 48, Russell-st., f., 261, 135d.; 1, g.r. of 1101, 165, 401, 451, 481, 491, 501, 511, 521, 531, 541, 551, 561, 571, 581, 591, 601, 611, 621, 631, 641, 651, 661, 671, 681, 691, 701, 711, 721, 731, 741, 751, 761, 771, 781, 791, 801, 811, 821, 831, 841, 851, 861, 871, 881, 891, 901, 911, 921, 931, 941, 951, 961, 971, 981, 991, 1,001, 1,011, 1,021, 1,031, 1,041, 1,051, 1,061, 1,071, 1,081, 1,091, 1,101, 1,111, 1,121, 1,131, 1,141, 1,151, 1,161, 1,171, 1,181, 1,191, 1,201, 1,211, 1,221, 1,231, 1,241, 1,251, 1,261, 1,271, 1,281, 1,291, 1,301, 1,311, 1,321, 1,331, 1,341, 1,351, 1,361, 1,371, 1,381, 1,391, 1,401, 1,411, 1,421, 1,431, 1,441, 1,451, 1,461, 1,471, 1,481, 1,491, 1,501, 1,511, 1,521, 1,531, 1,541, 1,551, 1,561, 1,571, 1,581, 1,591, 1,601, 1,611, 1,621, 1,631, 1,641, 1,651, 1,661, 1,671, 1,681, 1,691, 1,701, 1,711, 1,721, 1,731, 1,741, 1,751, 1,761, 1,771, 1,781, 1,791, 1,801, 1,811, 1,821, 1,831, 1,841, 1,851, 1,861, 1,871, 1,881, 1,891, 1,901, 1,911, 1,921, 1,931, 1,941, 1,951, 1,961, 1,971, 1,981, 1,991, 2,001, 2,011, 2,021, 2,031, 2,041, 2,051, 2,061, 2,071, 2,081, 2,091, 2,101, 2,111, 2,121, 2,131, 2,141, 2,151, 2,161, 2,171, 2,181, 2,191, 2,201, 2,211, 2,221, 2,231, 2,241, 2,251, 2,261, 2,271, 2,281, 2,291, 2,301, 2,311, 2,321, 2,331, 2,341, 2,351, 2,361, 2,371, 2,381, 2,391, 2,401, 2,411, 2,421, 2,431, 2,441, 2,451, 2,461, 2,471, 2,481, 2,491, 2,501, 2,511, 2,521, 2,531, 2,541, 2,551, 2,561, 2,571, 2,581, 2,591, 2,601, 2,611, 2,621, 2,631, 2,641, 2,651, 2,661, 2,671, 2,681, 2,691, 2,701, 2,711, 2,721, 2,731, 2,741, 2,751, 2,761, 2,771, 2,781, 2,791, 2,801, 2,811, 2,821, 2,831, 2,841, 2,851, 2,861, 2,871, 2,881, 2,891, 2,901, 2,911, 2,921, 2,931, 2,941, 2,951, 2,961, 2,971, 2,981, 2,991, 3,001, 3,011, 3,021, 3,031, 3,041, 3,051, 3,061, 3,071, 3,081, 3,091, 3,101, 3,111, 3,121, 3,131, 3,141, 3,151, 3,161, 3,171, 3,181, 3,191, 3,201, 3,211, 3,221, 3,231, 3,241, 3,251, 3,261, 3,271, 3,281, 3,291, 3,301, 3,311, 3,321, 3,331, 3,341, 3,351, 3,361, 3,371, 3,381, 3,391, 3,401, 3,411, 3,421, 3,431, 3,441, 3,451, 3,461, 3,471, 3,481, 3,491, 3,501, 3,511, 3,521, 3,531, 3,541, 3,551, 3,561, 3,571, 3,581, 3,591, 3,601, 3,611, 3,621, 3,631, 3,641, 3,651, 3,661, 3,671, 3,681, 3,691, 3,701, 3,711, 3,721, 3,731, 3,741, 3,751, 3,761, 3,771, 3,781, 3,791, 3,801, 3,811, 3,821, 3,831, 3,841, 3,851, 3,861, 3,871, 3,881, 3,891, 3,901, 3,911, 3,921, 3,931, 3,941, 3,951, 3,961, 3,971, 3,981, 3,991, 4,001, 4,011, 4,021, 4,031, 4,041, 4,051, 4,061, 4,071, 4,081, 4,091, 4,101, 4,111, 4,121, 4,131, 4,141, 4,151, 4,161, 4,171, 4,181, 4,191, 4,201, 4,211, 4,221, 4,231, 4,241, 4,251, 4,261, 4,271, 4,281, 4,291, 4,301, 4,311, 4,321, 4,331, 4,341, 4,351, 4,361, 4,371, 4,381, 4,391, 4,401, 4,411, 4,421, 4,431, 4,441, 4,451, 4,461, 4,471, 4,481, 4,491, 4,501, 4,511, 4,521, 4,531, 4,541, 4,551, 4,561, 4,571, 4,581, 4,591, 4,601, 4,611, 4,621, 4,631, 4,641, 4,651, 4,661, 4,671, 4,681, 4,691, 4,701, 4,711, 4,721, 4,731, 4,741, 4,751, 4,761, 4,771, 4,781, 4,791, 4,801, 4,811, 4,821, 4,831, 4,841, 4,851, 4,861, 4,871, 4,881, 4,891, 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ACID-RESISTING ASPHALTE.
WHITE SILICA PAVING.
SEYSSSEL ASPHALTE.

The Builder.

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View in South Entrance Hall.....	Double-Page Ink-Photo.
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The Imperial Houses of Parliament, Berlin.



IN the *Builder* of January 6 of last year we gave the plans of the two main floors of the Berlin Parliament Houses, with a detail elevation of the central portion of the façade, and photographs from the model of the building prepared for the Chicago Exhibition. These did not of course form a very satisfactory manner of indicating the external architecture of a great building, but they gave an idea of its composition, and they were that was available at the time. By the courtesy of Professor Wallot, the architect, we are now enabled to give fuller illustrations of this building, the largest and most important edifice in progress in Europe at the present moment. The exterior perspective view, reproduced from a very large and careful line drawing by Herr Gustav Almhübler (the architect who is at present engaged in designing the architectural features of Professor Begas's National Monument in course of erection), will enable our readers to form a better opinion of the exterior aspect and architectural treatment of the building than could be gained from reproduction from the model.

The interior view of the south hall and staircase, from a very large water-colour drawing in monochrome (our German architectural friends are heroic in the scale of their drawings), represents the view on entering the building by the central entrance on the south flank, the right-hand side of the plan published, as already mentioned, under date January 6, 1894. There is a corresponding entrance of similar design on the north flank of the building, but without the staircase. The design of one side of the Council Chamber is illustrated from the architect's working-drawing; the effect of this portion of the design is, however, somewhat distorted in the drawing by the huge blank spaces on the walls, which are ultimately to be occupied by large paintings. The design, that of the exterior of the building, is absolutely symmetrical, the drawing showing little more than half of the wall, the centre being in the middle of the large picture

space. An illustration of the sculptured panels on each side of the principal entrance under the central portico gives an idea of the style of the minor sculptured decorations of the building.* At a future date we may be able to give some illustration of the sculpture of the building, to which considerable importance is attached, and which has been the result of competition among the leading German sculptors of the day.

The Berlin Houses of Parliament have now been in progress for eleven years, and about 1,100,000*l.* has already been spent on the building. A further expenditure of about a quarter of a million will be required for the entire completion of the building, which is not expected to be achieved for about five years more.

The building was the outcome of two successive competitions, in 1872 and 1882. In the second competition Herr Wallot, of Frankfurt, obtained the first premium, and Professor Tiersch, of Munich, the second, and Herr Wallot after some time received the commission, but with instructions to revise his competition design. During 1883 three sets of plans had to be prepared in succession; and what with the continual alterations in the programme of the special committee entrusted with the supervision of the building, and the architect's own modifications, the design eventually approved by the authorities prior to laying the foundation-stone varied very materially from the premiated design. The foundation-stone was laid in June, 1884, and the works were commenced, but finally as to the design had even then by no means been attained. The architect was continually harassed by new requirements, and the want of a strong and decided policy in the Committee was much felt. Herr Wallot was further hampered by a contradictory desire, on the part of this Committee, to retain as much as possible of the elevations shown in the premiated design, in spite of the radical alterations demanded in the plan and arrangement. Among these were the lowering of the Council Chamber floor by about 10 ft., and the change in the position of the cupola from the centre, over the Council Chamber, to a front position. Various discrepancies between plan and exterior design

were thus produced, for which the architect is not responsible. The plan, for instance, shows the piers provided and partly carried out for the cupola over the Council Chamber, which was subsequently condemned. The minutes of the committee in charge of the erection form amusing reading, or would do so if the spectacle of dilettante incompetence and want of purpose which they display were not rather a sorry one. The moral of the whole is—do not interfere with your architect.

All these circumstances should be borne in mind in forming an opinion on the architectural success or failure of the building. We fear there is little probability that it will be much admired in this country; and in regard to one feature, the central cupola, with its ugly lines of roof and its lantern resting on iron and glass, we have already expressed our opinion that it is probably the worst central feature erected over any national Government palace in the world. The fact that the position of the cupola on plan was altered after the building was commenced cannot be held as accounting for or excusing this unhappy superstructure. The plan shows piers of sufficient mass to have carried something better than this. But in regard to the remainder of the design, English architects who find themselves little in sympathy with it must remember the character of the nation for which it is erected. Except as regards music and the mounting of plays and operas, the Germans of the modern era can hardly be said to be an artistic people. But they are a strong, resolute, and practical nation, and still influenced by the recent memory of a great conquest. And there is something in the style of their Palace of Parliament which not inaptly reflects and expresses these characteristics. The absolute and almost defiant symmetry of the plan of the building, with its spacious columned halls opening right and left from the great octagon entrance-hall, carries an assertion of power and display with it. The solid treatment of the lateral portions of the front, between the portico and the angle wings, with the applied columns so completely a portion of the wall, and the heavy stringcourse under the windows cut off against them, has a fine effect; and the design of the open story over the angle pavilions, useless as it is, has a certain originality and interest. The character of

* The precise position of these panels will be seen in the detail elevation of the central portico already referred to, published among our illustrations of 1894.

bravura and "swagger" about the sculptural decorations strikes English eyes as coarse, but it is at all events not deficient in vigour, and it is in harmony with the traditions of German decorative art. The building would not suit us, still less would it suit the French, but it expresses the German character, as a national building should; indeed, the contrast between the Berlin building and the Paris Hôtel de Ville would be not a bad emblem of the difference in character of the two nations. And there are fine and effective portions of the interior which we have not yet been able to illustrate, but which would probably command general admiration. If the upper portion of the cupola were rebuilt on better lines, the building would be an adequate representative one for the German nation. Perhaps it is not too late to hope that this improvement might still be effected.

ALPHABETS: FROM AN ARTISTIC POINT OF VIEW.

THE perception that the design and placing of letters is not a mere matter of convenience of reading, but includes also an element of artistic effect, has been quite recently revived among us, after lying dormant for more than a century. The production of a book on alphabets,* giving an outline of their history and development, but treating them also with special reference to the question of design, comes, therefore, at an opportune moment.

In the present day we have mainly to consider the question of printed letters, except in regard to lettering which forms a portion of a drawing, and is executed by the artist. Of late years, as everyone must have observed, it has become a common practice with those who make sketches of architecture (more especially for publication as illustrations, to incorporate the title with the drawing, as a portion of it, to be reproduced along with it. It is not surprising that it is with architectural draughtsmen and sketchers more particularly that this practice has obtained, as they have a keener eye for decorative effect than many other classes of artists, and prefer to render their title a decorative addition to the drawing, rather than leave it to receive the printer's "line" as an excrescence beneath it. No one has done better in this way than Mr. Herbert Railton, whose titles to his sketches are admirably picturesque, and have received the compliment of a considerable amount of imitation. The subject of artistic style in ordinary handwriting is not without its interest, though owing to the hurry in which correspondence in the present day has to be carried on there is little opportunity for attending to style in handwriting; legibility is all that can be attained, and more than many correspondents even aim at; while the increasing use of the typewriter, with its ugly mechanically-formed letters, is more and more tending to deprive correspondence of its individuality of character.

But in the days before printing, when writing was carried on slowly and deliberately, and for several centuries, during the Mediæval period, was used mainly for the transcribing of books and the drawing out of official documents, such as charters and deeds of gift, the style and formation of the letters was evidently as important a consideration as it ever was in the best days of printing, and some forms of printed letters have been directly derived from forms previously used in manuscript.

Mr. Strange's treatment of the subject, therefore, commences, naturally, with manuscript alphabets, though the very first example he gives, not from manuscript but from Roman capitals carved in stone (fig. 1),†

* "Alphabets: a Handbook of Lettering, with Historical, Critical, and Practical Descriptions." By Edward F. Strange. London and New York: George Bell & Sons, 1895.

† The examples given in this article are reproduced from Mr. Strange's pages, but nearly all of them in considerably reduced size, being given here mainly in explanation of our remarks. In the book itself they will be found on a larger scale.

is remarkable as showing how completely the Romans settled for all the succeeding centuries the main form of capital letters. This alphabet, as the author observes, is the ideal one for inscriptions on



Fig. 1.—Roman Capitals carved in stone.

stone on a grand scale, and is a characteristic monument of the Roman nation. Cut inscriptions, however, are one thing, and written inscriptions another, and comparatively early in the Christian era we see how the freedom of line available with, and even suggested by, the use of the pen in one form or another, began to show itself in the increased licence taken in the forming of letters, the temptation to indulge a kind of draughtsman-like flourish and abandon in the treatment of the extremities of letters, and to seek picturesque effect in carrying certain letters above or below the general line of writing. This latter habit reached an inconvenient, and even ludicrous, excess in the official writing of the early Mediæval period; many of our readers have probably noted the exaggerated form of this style of writing in some of the Mediæval documents which are to be seen by every visitor in the cases in the King's Library at the British Museum. Mr. Strange gives one specimen of this type of writing, "écriture diplomatique," from a MS. of the date A.D. 1119, though the extension of the letters upward and downward is by no means so abnormally developed as in other examples of later date. On the other hand, there has been a great amount of writing produced, in the earlier centuries of the Christian era especially, which is almost as neat, regular, and finished as print; Mr. Strange gives a beautiful example from a Sallust of the seventh century.

In these and other ancient examples it is remarkable how evidently the scribe was possessed by the idea of giving his page a decorative effect, a consideration which seems in fact to have often quite taken precedence of any desire to render it easily legible. A typical example in this sense is that of the Lombardic writing from a MS. of the thirteenth century (fig. 2), at the monastery

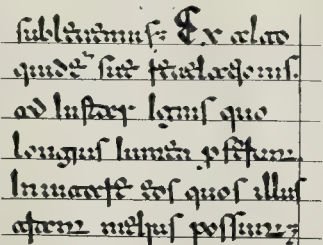


Fig. 2.—Lombardic Writing: thirteenth century.

of La Cava. This is unquestionably decorative in effect, and has a fine bold character, but

it is certainly not very legible writing. And perhaps in the maintenance of this kind of decorative conventional hand we may find one explanation of the illiterate character attributed to many great men in the early and middle centuries of the Christian era. Writing was then a special profession, and was obviously not to the interest of the professional scribe to make the matter easy to outsiders, any more than it is to the interest of lawyers to draw up legal documents in ordinary vernacular English, or of doctors to write prescriptions in intelligible language. In each of the cases there has been a professional "mystery" to keep up; the Mediæval scribe had every inducement not to write so that everyone could either imitate or understand his writing; and that Charlemagne could not write his name was, perhaps, for the age, no more evidence of want of learning than for a modern sovereign to be unable to draw up a conveyance in proper legal phraseology.

Coming to the age of printing, we find in the early block type a striking similarity with some of the penmanship which preceded it, and when we come to the great era of the sixteenth century the author tells us that the "italic" form of type, which has played such a large part in printing ever since it was introduced, is credibly reported to have been evolved by its author, Francesco de Bologna, from an imitation of the handwriting of Petrarch. No one who has studied any examples of the noble and beautiful handwriting used by some of the great Italian artists and men of letters of the Renaissance period, will have any difficulty in believing in this origin of the "italic" type, which has the advantage of combining the regularity of print with the appearance of the free curve of handwriting. We are so accustomed in modern days to regard italics as a special form of type to emphasise or set apart a special sentence, that many who are not familiar with "olde bookis" probably hardly realise that this was at one time an accepted form of type for some of the most carefully produced editions of the Latin classics. There have been some attempts to revive it recently, as in Mr. Saintsbury's preface to the charming illustrated edition of "Pride and Prejudice," published by Mr. George Allen, but we doubt if modern readers will take to it. However pleasing it may look on the page, as to general effect, it is certainly far less easy and agreeable to the eyes, for continuous reading, than Roman type.

In fact, we may take it that Roman type in one modification or another, is fixed as the type of modern books. The blackletter type has long been such a curse to German literature, that it is a wonder that it has not been exterminated long since. We must refer the reader to Mr. Strange's pages for a study of the various forms of lettering which have been used and abandoned since the Renaissance. It is sufficient here to say that the most usual form of type of the nineteenth century has of late been almost universally condemned by those who have made a special study of the subject. According to Mr. Strange, we owe our modern form of type more especially to the influence of Bodoni, who, however, was not a born nineteenth century man, but lived into the present century, and his manual of specimens was published by his widow in 1818. The author gives some specimens of his type, and contrasts it with specimens of the eighteenth-century types of Caslon and Wilson. There is, perhaps, a little exaggeration both in the condemnation of the Bodoni type and the praise of the eighteenth-century specimens, and allowance must be made for a certain interest of archaeological sentiment attaching to the eighteenth-century forms. Bodoni's type has the merit of high finish and very legible quality, whereas some of the Caslon specimens rather want finish, though for legible quality they are excellent. The distinction is that the finish of the Bodoni type is mechanical finish and wants character; moreover, the thin lines of the letters are so

thin as to take away from the solidity of appearance of the letter, and, in fact, actually to weaken it; while this attenuation of the thinner lines also prevents the page from presenting so even a distribution of black and white as is shown by the eighteenth-century forms of type. Mr. Strange points out another source of the poor and mechanical effect of Bodoni's style of letter, in the fact that he reduced to the smallest proportion the gradated portion of the curves. Two lines in Caslon and Bodoni type may be compared here (figs. 3, 4); as every one

Quousque tandem
abutere Catilina, p
Quousque tandem a-
butere, Catilina, pa-

Fig. 3.—Caslon Type: 1766.

Quousque tandem a-
butere, Catilina, pa-
tientiâ nostrâ? quam-
diu nos etiam furor
iste tuus eludet? quem
ad finem sese effrena-

Fig. 4.—Bodoni Type: present century.

who has attended to the subject knows, the effect of a differing design on the type is often not fully appreciable until a whole page of the two is compared.* Part of the character of the Caslon specimen, it will be seen on close examination, arises from the oblique terminations of the extremities of the shanks of letters (see the first strokes of the n and m, and the top of the b and d shanks, for instance). This is also a characteristic of the beautiful fount of Roman type which Mr. Morris has designed for his work at the Kelmscott Press, and which for legible character combined with well-balanced effect on the page seems quite perfect, and is superior to the Caslon specimens. Mr. Morris designs the loop of the small e with an oblique closing line also, which contributes very much to the consistency of character of the type.

It may be observed that the want of boldness and character in design which Mr. Strange justly complains of in the Bodoni capitals, is to some extent a defect of the Roman carved alphabet above quoted (fig. 1), as will be readily perceived on comparing it with the letters given by Mr. Strange (fig. 5) from the tomb of the Emperor Henry VII. (Italian fourteenth century). For plain letters there could hardly be more finely designed capitals than these, which can be studied on a much larger scale on Mr. Strange's page. One important point to be noted in this lettering is the freehand character of the design, which does not appear to be reducible to, or derived from, geometrical curves. Mr. Strange speaks quite rightly, in one passage in his book, in favour of this freehand designing of letters, and observes that letters geometrically formed from portions of circles are seldom interesting or satisfactory in character, though he does give one specimen of a fine black-letter alphabet of Albert Dürer's in which the letters, as shown in a construction diagram, are all reducible to collocations of small squares. It may be questioned

however whether the result might not have been just as good if the construction had been less formal, though the formality



Fig. 5.—Capitals: Italian, fourteenth century.

perhaps gives a specially architectural character to the lettering, when used on a large scale.

At the present time, among those who take an interest in the artistic aspect of lettering, the preference is for the Renaissance form of Roman letters such as are illustrated in fig. 5; nor could a finer model be found. It is a form of letter at once artistic and legible, and is far superior in refinement of taste to any of the forms of "black letter" which were not long ago so much in fashion for ornamental titles and inscriptions. There is plenty of room, however, for variety of taste and fancy in designing letters in this general style, but without a slavish adherence to precedent. It appears that the Americans have already made some very good and successful experiments in variations of alphabets mainly founded on Renaissance forms, of which several are given in Mr. Strange's book, and are worth attention. A form of Anglo-Saxon alphabet of the seventh century (fig. 6), though some of the letters would be too archaic and enigmatical for modern use, affords a fine suggestion for cases in which, for a special architectural and decorative effect, a very square, simple, and monumental form of letter is wanted. The forms of the N and Q are noteworthy, and the occurrence of the Greek

form of the letter P in this alphabet is curious. To the horrible class of things called "fancy lettering" Mr. Strange naturally devotes little attention, beyond

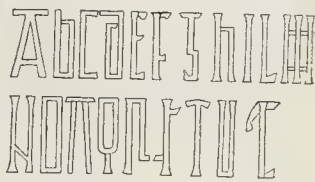


Fig. 6.—Anglo-Saxon: seventh century.

giving a few of the worst forms to show what descents can be made in this direction; but we are surprised to observe that, while evincing a righteous horror of these, he can speak in such admiring terms of what he calls the "very beautiful alphabets of ribbon-letters" of the sixteenth century; German, of course; no other country, let us hope, would have been guilty of them. We should call them detestable. Is it merely because they are old that Mr. Strange feels a tenderness for them, and wastes two pages of illustrations on them?

The arrangement of lettering as well as the form of type is now receiving a good deal of revived attention from artists and artistic writers. It is a common thing now to find the arrangement of lettering on a title-page, for instance, instead of being left to the routine of the printer and his long and short lines, made a special study in regard to its arrangement on the page, especially in books on subjects connected with decorative art of any kind. In some of these cases the taste is somewhat too obviously archaeological—an imitation of an old style of title-page; but there is plenty of room for design in such work without dropping into mere archaism. One of the sources of effect and character, especially in the use of the Renaissance form of Roman lettering, lies in the treatment of single letters in a special manner, following some suggestion arising out of their general form, or in the linking of letters or placing one within another. As Mr. Strange observes, this kind of fancy should be sparingly indulged, but within proper limits it is a source of a good deal of characteristic effect. An example given by



Fig. 7.—Romano-British Lead-Stamp.

Mr. Strange (fig. 7) from a stamped inscription on a Romano-British pig of

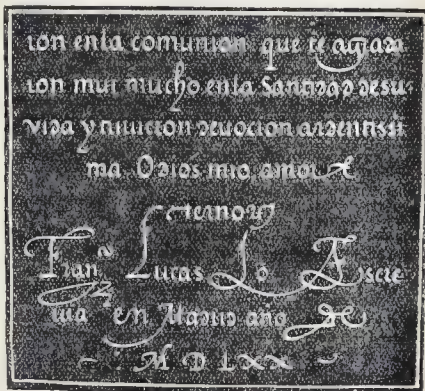


Fig. 8.—Handwriting: Spanish, 1570.

* To many persons, we believe, it is not appreciable even then. The type of this journal was changed one day four or five years ago, from the type of the usual modern class—the Bodoni class—to the one more in the eighteenth-century style which we have since used. But we never had any evidence, at all events, that a single reader had noticed the difference.

lead, is interesting as showing the picturesque effect of this kind of device in a case in which it was evidently not used for any æsthetic reason, but merely for the sake of compression. The maker of this inscription found, as modern designers of inscriptions often find, that L and T are very suggestive letters to play with a little. Any device of this kind should always appear, however, to emphasise some natural characteristic of a letter; the vertical character of T, the long horizontal limb of L, the tail of R or Q, &c. In the case of written titles on drawings, the artist still has the opportunity of exercising character in pure penmanship, for which he will find many suggestive hints in Mr. Strange's pages, always remembering that the character of the writing instrument used must determine, to some extent, the character of the writing. Both Italian and Spanish manuscripts are rich in suggestions for the study of artistic handwriting. The Spanish forms are less known than the Italian, and we reproduce (fig. 8) a portion of an example of beautiful Spanish writing by Lucas of Madrid (late sixteenth century), an example of what is called the "redondilla" hand, and is a model of clear and clean design in hand-writing.

There is far more both in the way of information and examples in Mr. Strange's book than we have been able to indicate; in fact, there is not a superfluous page in it (except the ribbon-letters), and it would be difficult to find a book of under 300 pages with more information compressed into it. There is a great deal in it to suggest thought and new ideas on the subject of which it treats, and the turning over the numerous examples engraved on its pages is in itself a training to the eye in the appreciation of varieties of letter-form. A list of books of reference on manuscripts, painting, collections of alphabets, &c., is added at the end of the book.

NOTES.



THE important paper read by General Annenkoff at the International Geographical Congress, though a little out of the direct line of subject for such a Congress, merits every attention. The main point of it was, the importance of taking a world-wide survey of the conditions of food-produce and labour. He showed by statistics how unequal was the supply and the consumption of food in various countries. What was required was to produce, with the least possible loss of human strength, the greatest possible sum of the produce most necessary to the comforts of all. In order to do this, he said, it was necessary to explore and study new countries with a view of obtaining the greatest amount of produce at the lowest possible prices, by selecting what would be the most advantageous productions to send to countries where the inhabitants had the means of producing things of greater value. Both countries, the one providing and the one importing, must be provided for on equal conditions of cheap rates; and that, he suggested, was the end to which the efforts of geographical societies should be directed in our day. It would have been more correct to say, "one of the ends," but at all events, this is a new and practical application of the extension of geographical knowledge. Everything seems to be tending in the present day towards a generalisation of work and statistics for the world at large. We are probably within measurable distance of the adoption of a "world-time," when an immense amount of inconvenience will be saved by the abolition of local time and the unification of clock-time for all latitudes. Nothing but the concurrence of all the civilised Governments is required to effect this—or the concurrence of all the great States, for the lesser ones will be under the necessity of following them. Another evidence of this generalising tendency is to be seen in the resolution of the Geographical Congress in favour of the production of a world map to the scale of

1—1,000,000, to be available equally by all countries. The Congress has made two important steps towards the accomplishment of this object, by agreeing on the acceptance of the Greenwich meridian, and on the metre as the unit of measurement. The question of language to be adopted is a more difficult one, and is to be reported on to the next Congress at Berlin. We should expect that for all merely descriptive matter the French language would be agreed upon, as the most general language of intercommunication among educated people of different nations; but in regard to the naming of places we should suggest that the most rational and logical system would be to write the names as they are written in the country to which they belong. We should then fix the names of towns finally, and get rid of the anomaly of a city being called "London" in one language and "Londres" in another, "Köln" in one country and "Cologne" in another, and so on. This assimilation of names would be a great convenience, and it seems fair to assume that each country has a right to dictate the spelling of the names of its own cities. Besides which, each country would be much more ready to adopt the map if it found its own cities and places spelt in its own traditional manner.

WE are glad, of course, to see that various gentlemen who feel an enlightened interest in Greek archaeology are promising subscriptions to the British School at Athens for five years to come, or have given liberal donations; all honour to them; but this is only a half measure. What we want is to see the British School at Athens endowed by the British Government; and that moreover is what it is the moral duty of the Government to do. No one who cares for seeing the place of England in archaeological investigation honourably maintained can be satisfied with anything short of that.

THE next Trades' Union Congress will meet under peculiar and novel circumstances, for some very familiar and by no means unimportant delegates will be missing. Following the example of their Durham neighbours, the miners of Northumberland have decided not to send representatives to the forthcoming Congress. The northern miners are outspoken men, and have given their reasons for taking this step with characteristic frankness. They are not unwilling to fall in line with their fellow-workers for useful, practical purposes; but they regard the Congress as being, at the present time, a mere instrument in the hands of extreme, impractical Socialists. This is a serious blow to the latter, coming, as it does, just as they have experienced such a rebuff at the polls. We are not aware of any further secessions from the Trades Union Congress, but it would not be surprising were other bodies to take up a similar attitude to that of the miners of the north. Looking back at past gatherings, it is patent enough to outsiders that the bulk of the proceedings is simply so much time wasted in vain, wild talk, and in passing barren and impracticable resolutions. This is beginning to be recognised from within.

THE question raised in the action of the Wandsworth Board of Works v. the County of London and Brush Electric Lighting Company is one of considerable importance to public authorities and electric lighting companies. It was whether, under the terms of the provisional order which authorised the placing of "boxes" under the streets for certain purposes, the defendants were at liberty to construct chambers of considerable size under the streets of the plaintiffs' district. When electric lighting first came in it was the universal custom to have separate transformers, and therefore separate transformer-chambers, for

each house. It is now found far more economical to have what are called transformer sub-stations—i.e., to have several transformers together at particular points, and to supply the energy by means of these, at a lower pressure, to all houses within a radius of about 200 yards. The size of the transformer-chambers which the defendants claim the right to put under the public streets was 10 ft. 3 in. deep, 7 ft. 6 in. long, by 5 ft. 6 in. wide, the use of chambers of this size having been sanctioned by the Board of Trade. The objection of the Wandsworth Board of Works was that the Board of Trade, in sanctioning these chambers, had authorised something which, according to the terms of the Parliamentary order, the defendants were not entitled to use. On Saturday last Mr. Justice Stirling gave judgment, coming to the conclusion that the transformer chambers were "boxes" under the meaning of the Act, and that the Board of Trade had not gone beyond their power in sanctioning them. The action was accordingly dismissed, with costs. It is obvious that the taking up of these large spaces underneath the street is a very serious matter. The Board of Trade will have plenty to do in reconciling conflicting interests, as these transformer chambers will often be extremely inconvenient for many public purposes. The public will not be very easily satisfied as to their safety, the many accidents last winter due to explosions of coal-gas in street-boxes having naturally made them careful. It will also impose on the London County Council a greatly-increased obligation in the way of supervision, with a corresponding increase of cost to the ratepayers. To set off against these drawbacks, the permission to make these chambers will be a great boon to electric-lighting companies, and will encourage them to extend their sphere of operations to poorer districts with a reasonable expectation of profit.

THE case of Wood v. the London County Council, heard before Mr. Justice Grantham and Mr. Justice Lawrence, appears to settle a point of some importance in regard to carriage-ways for access to a block of houses in flats, built as a quadrangle with a courtyard opening from the street. The appellant had been convicted before a magistrate for an infringement of Section 7 of the London Building Act, 1894, in "laying out a street for carriage traffic" without having obtained the sanction of the London County Council. The judges reversed the magistrate's decision. The appellant had built mansions round a quadrangle on a site formerly occupied by buildings, and proposed to leave a lawn with a carriage-way round it, wide enough for carriages and cabs brought there by the tenants of the mansions. The entrance was closed by gates, and the whole thing, the learned judges said, "was as private as could be." The court had not been asked to define the word "street," and did not attempt it. But it decided that this was not a "street." We entirely concur in the decision, though we think the County Council was justified in bringing the original action in order to test the point.

THE Medical Officer of Health of Lowestoft, in his last annual report, expresses the opinion that the sewer ventilation by open manholes bore a casual relationship to the increase in diphtheria throughout the country; we presume this latter phrase means the neighbourhood of Lowestoft. At all events, the Local Sanitary Authority has ordered that every surface ventilator within fifty yards of a ventilating-shaft, and also any within fifty yards of any public or large private school, shall be closed; and that the remaining surface ventilators should be closed in succession as soon as a ventilating-shaft should have been erected within fifty yards of them. If the erection of ventilating-shafts at Lowestoft is progressing, the Medical Officer will in his next Report

be in a position to give us some information as to the effect of this change on the prevalence of diphtheria in the town. The flushing of the sewers with sea-water, which at a seaside place can be had for the pumping, is strongly recommended, the Medical Officer urging that there is "no better fluid for the purpose."

THE Annual Report of the Carpenters' Company, for 1895, states that the examinations at the Stratford Institute have been very satisfactory in their results, the grant from the Science and Art Department being considerably larger than in the previous year. Referring to the series of popular lectures given during the past year, regret is expressed that more members "of the Livery" do not avail themselves of the opportunity of attending these lectures. The report concludes as follows:—

"The Court feel sure that the large amount of educational work they are carrying out will be of immense advantage to the Company in the event of any further inquiry as to the funds of the City Guilds, and connected as we now are with other Companies at Titchfield-street, they believe that a permanent bond of union has been established, and will be able to show that an amount of useful work is being accomplished far beyond the ideas of those who are disposed to question the desirability of the continued existence of the Companies."

HAVING lately established their school in the new premises, Barnard's Inn, the Mercers' Company seek tenders, on lease for eighty years, for the building site of their old school premises, in College Hill. Those premises, having an area of 4,900 ft. super, stand on the site of Whittington's Almshouses—next to St. Michael's Paternoster (Tower) Royal Church—which were pulled down for the then new school buildings, erected in 1808 after George Smith's designs; the almshouses being rebuilt at Highgate. The Mercers' School has seen many removals during the past 500 years. In the middle of the fifteenth-century it was held at St. Thomas of Acon's Hospital, in Cheapside, founded by Thomas Becket's sister, which, at the Dissolution, was acquired by the Company for their hall and chapel. The school was next taken to St. Mary Colechurch, and thence, after the Great Fire, to the west side of Old Jewry, where is now Frederick's place. In 1787 the boys migrated to Budge-row, and thence, after seventeen years, to Red Lion-court, Watling-street. There they remained until the opening of the new buildings on College Hill. Bishop Wren, Sir Thomas Gresham, and Dr. Colet had their education at this school. College Hill and College-street (antiquely Elbow-lane) are so-named from the fact that Whittington's executors, as he had directed, completed his project of rebuilding St. Michael's church as a college, dedicated to the Holy Ghost and the Virgin, for a master, four fellows, conducts, and choristers; and of founding a hospital ("God's house") as an almshouse for thirteen poor men. He was buried in that church three times; his remains being disturbed in the reign of Edward VI. through the cupidity of the incumbent, who fancied that riches had been placed in the tomb, and again in Queen Mary's reign. On the monument his name had been inscribed as "Richardus Albifrons Villam." The school is believed to have been established circa 1456 by John Niel, Master of the Cheapside Hospital: some claim for it a foundation coeval with that of the hospital itself.

NEXT autumn will be offered for sale the territorial domain of Kilmuir, in the north of Skye, a property wherein are situated Monkstadt, Kingsburgh, St. Columba's Loch, Kilbride, Floddigarry, and other places that form the scene of Flora MacDonald's heroic story, and of nearly all her married life, as well as of her grave. Kilmuir covers 46,000 acres of the northern portion of Trotternish. Known as the

"granary of Skye," it contains the largest continuous tract of arable land in that island. With a seaboard of about thirty-five miles, its rugged coast presents many fine specimens of basaltic formation, especially south of the dismantled Duntulm Castle—a stronghold of the clan Donald, built in the twelfth century over a ruined Viking fort—and around Loch Staffin, near Quiraing, whose verdant plateau of singular beauty lies within a ring of columnar masses of basalt rock, rising in lofty and for the most part inaccessible peaks. Scattered about are numerous Culdee cells, and ancient earth-works; on Fladdachuain island is the site of a Druidical temple. At the estate's south-western corner is Kingsburgh, on the shore of Loch Snizort; the road goes northwards to Uig, thence to Monkstadt, and so on to Kilmuir Kirk, between which and Aird Point is the wave-beaten head of Duntulm. At Kilbride, close by Monkstadt and Kilmuir Kirk, Charles Edward (disguised as "Betty Burke"), Flora MacDonald, more correctly Fhionnghaill MacDhonnai, and Neil MacEachainn landed, Saturday afternoon, June 28, 1746, after their perilous voyage of fifteen hours in an open boat across Little Minch, from Rossinish, in Benbecula of the Western Isles, where, whilst visiting Nunton, the Clanranald's seat, she, on the previous day, had first met the Prince. Flora's grave had been for long unmarked when in 1871 was set up a new memorial in shape of a monolithic Iona cross, carved from Kemnay granite by Mr. D. Forsyth, after Mr. Alexander Ross's designs—both being of Inverness. The cross, 28 ft. high, and standing 300 ft. above the sea, was afterwards overthrown and broken by a storm, but was, in a measure, restored.

UNDER the title of "A New System of Public Baths" Mr. Kane, the Superintendent of Public Baths to the County Council of Newport, Monmouthshire, sends us what can hardly be called a book, but a small pamphlet of suggestions,* in regard to an improved method of providing cheap baths for those who require them mainly for cleansing purposes. The author regards the usual form of slipper-bath as wasteful of water and (as generally used by the poorer classes) inefficient for cleansing purposes. Moreover, with its closed door, it is dangerous for persons liable to fits or who may go to sleep in the bath. Mr. Kane proposes a plan by which bathers who come mainly for cleansing purposes should have a range of undressing-rooms, with doors at each end, whence on one side the bather would go to a warmed waiting-room, thence to a room where he would be scrubbed by an attendant, as in a Turkish bath, thence to a towelling-room, and back to his dressing-room by the opposite door from which he left it. The author calculates that one attendant could wash eight people with forty gallons of water during the half-hour in which one slipper-bath customer was employing forty gallons to himself—inefficiently, according to the author, who asserts that no man can thoroughly wash his own back and shoulders; rather a serious statement, considering the large number of men who cannot afford to keep male attendants; but we deny the assertion. Providence, or Nature, took care to provide that the hands could reach every part of the body. As to the main question, however, we have no doubt that Mr. Kane is right, and that people whose avocations lead them into dirty work could get at least as thoroughly cleansed in the way he suggests, at a great economy of time and water. But we fear there would be a great amount of prejudice to be got over before it would be much used. If any trial is made of it on a large scale, we should be glad to hear the result.

THE Seventeenth Annual Report of the Glasgow Architectural Association shows a good record of work. The list of

papers read and lectures delivered covers a considerable variety of important subjects, including "Byzantine Architecture" (Mr. Allan Graham), "Planning of Public Baths" (Mr. John Fairweather), "Planning of Country Houses" (Mr. Wm. Fraser), "Art Metal Work" (Mr. George Adam), "Egyptian Art" (Mr. James Chalmers), and a good many others on equally interesting and important subjects. The visits have been more numerous than before, and have been well attended. In September of last year a memorial was addressed to the Town Council relative to the proposed removal or setting back of the Tron Steeple, and praying that this notable piece of city architecture be left as at present. The memorial was laid before the Council, with the result that for the present at least the Improvement Trust has abandoned the idea. In the same month the attention of the Association was drawn by a member to the state of repairs in progress at the Cathedral. A committee, consisting of the Hon. President, President, Vice-President, and Mr. C. E. Whitelaw, was appointed to investigate, and to take such action as might be thought desirable. In consequence of the report of the committee, it was decided to communicate with Mr. W. W. Robertson, of Her Majesty's Office of Works, but in the first instance to call the attention of the Glasgow Institute of Architects, as the senior Architectural Society in the city, to the matter. Memorials were forwarded by both societies urging the desirability of not interfering with the internal stone work farther than might be absolutely necessary. Replies were received sufficient to remove any apprehension regarding the character of the repairs, but the committee has been continued in office to act as a vigilance committee. The most noteworthy event of the work of the Session has been the successful arrangement of a scheme of co-operation with the Glasgow Institute of Architects for the acquirement of premises to be jointly occupied by the two societies. Early in the session the terms were made known of a competition for a Travelling Studentship of the value of ten guineas, open to all architectural students in and around Glasgow under the age of twenty-five. The prize is the joint gift of the Hon. President, President, and the Association. The subject set was a Village Institute, to be placed in an open site. Six sets were received in competition, and Mr. George Gunn, A.R.I.B.A., was declared the successful competitor. According to the conditions imposed, a tour of not less than a fortnight's duration must be taken out of Scotland. Volume iv. of the Sketch Book has unfortunately not been a financial success, and notwithstanding the efforts of those in charge to increase the demand for it, about 100 copies still remain on hand. The committee, therefore, do not feel justified in commencing to collect material for vol. v. until they are confident of more hearty support. It is to be hoped that they will obtain this, for as far as it has gone, the Glasgow Architectural Association Sketch Book forms a very good collection of work.

WE stated, under the head of "Competitions," last week that the second-placed design in the competition for the Durham County Council buildings had been chosen to be carried out instead of the first premiated one, on the ostensible ground of economy. There appears, however, to be more to come out about this business, which has a very suspicious appearance. We hear, on good authority, that the assessor did not place the design of Messrs. Barnes and Coates second; his report has been kept private by the Council; the architects are local men, and a connexion of one of them is an Alderman. All this looks very like a repetition of the old and often-acted discreditable story of competitions for small municipalities. Messrs. Cooksey and Cox, to whose design the assessor unquestionably did award the first premium, have not even had official com-

* Published by Simpkin, Marshall, & Co.

munication from the Council on the subject, but have simply been thrown over without explanation. A memorial is to be addressed to the Durham County Council on the subject, from some of the other competitors.

THE NEW GRAVING-DOCK AT SOUTHAMPTON.

THE maritime trade of Southampton has so greatly increased of late years that additional facilities for the accommodation of the larger vessels which now frequent this important port were almost essential if its prosperity was to be maintained. No other town in the United Kingdom has shown more energy in securing a fair share of the trade of this country, and this fact, taken in conjunction with the natural advantages which it possesses, and the enterprising policy of the directors of the London and South Western Railway, who are, in a large measure, responsible for the progress that has been made in this direction, now causes Southampton to be recognised as the first port on the South Coast.

Soon after the purchase of the docks by the above railway, which property, it would appear up to that time had never been remunerative, it was announced that the Inman line of ships would henceforth come to Southampton instead of Liverpool, which they had previously made their head-quarters, and this to a large extent compensated for the serious loss the port had sustained when the Peninsular and Oriental Company decided to transfer the whole of their extensive trade to the Thames.

Directly the purchase was effected, the new owners of the docks commenced to make such alterations and improvements as would secure additional trade, by dredging the channel so that the largest ships could enter the Empress Dock even at the lowest spring tides, and by procuring from the town authorities a large expanse of land for the construction of the graving-dock which has just been completed, and which was opened by the Prince of Wales last Saturday. By affording such efficient accommodation, various large shipping owners have been induced to send their vessels to this port in preference to others, and so great have been the facilities offered that it is not surprising to learn that the trade during the last few years has materially increased. Formerly, when ships were built to suit the existing dock accommodation that could be obtained, it was not so important to study the owners' requirements, but now that the size of vessels has been so much increased it has become necessary to construct suitable docks for them, and those ports which do not recognise this fact must necessarily be contented with the trade brought by ships of comparatively small tonnage.

The new graving-dock has been made on the south side of the Empress Dock. It has been constructed in accordance with the designs of Messrs. Galbraith & Church, the engineers to the London and South-Western Railway Co., and has been built by Messrs. Lucas & Aird, contractors, in two and a-half years—a very short time, considering the difficult nature of the work which had to be accomplished. It is 750 ft. long, 87 ft. 6 in. wide at sill level, 112 ft. 6 in. wide at quay level, and 42 ft. deep, and, consequently, it is the largest dock of this kind in the world.

Up to the present time all the ship repairing that was needed at Southampton had to be performed in four dry docks, which varied in length between 250 ft. and 450 ft., and in width between 51 ft. and 80 ft., with a depth of water of only 15 ft. to 25 ft., but the one now provided, being of much greater capacity than any of these, will be able to accommodate even the largest vessels using the port. It has been constructed on land which has been reclaimed between the rivers Itchen and Test, and open direct into the Empress Dock. Considerable trouble was experienced in forming this entrance, as it was firstly necessary to construct two coffer-dams to enable some 4,000 tons of concrete to be removed, for which purpose gellignite had to be resorted to for blasting.

Portland cement concrete is used throughout for the walls, which are built in steps, as is usual in work of this character. These walls are, however, faced with brickwork, which is itself faced with blue bricks. The coping along all the walls, the sluice-faces, and other important portions of the work, are all composed of Cornish granite. A caisson is placed between the graving-dock and the Empress Dock, and this is used also

as a bridge, since its deck is fitted with permanent-way in connexion with the existing railways, and a gangway for foot-passengers on either side. This caisson was built by Messrs. G. Rennie & Co., of Greenwich; it was erected near the site, and, after completion, was launched forward and finally lowered into position. It is 95 ft. long and 25 ft. wide, and is ballasted with 460 tons of cast-iron kentledge, and can be floated into a recess provided for it.

The water is admitted to the dock through two 7 ft. 4½ in. culverts, the operation of filling occupying two hours, and after a ship has entered is required to pump the dock dry again. Very powerful machinery has been supplied and erected by Messrs. J. & H. Gwynne for this purpose, the plant consisting of two of their Invariable Centrifugal Pumps, each driven direct by a pair of vertical high-pressure steam-engines of 200 horse-power. A third pumping-engine of similar design, although of smaller dimensions, will be employed to empty the culverts, and generally to overcome any leakage that may probably occur. The suction and delivery branches of the pumps are each 4 ft. in diameter, and the valves in connexion with them are actuated by hydraulic power. The pumping-station is placed on the east side of the dock, and contains six Galloway boilers, each 30 ft. long by 7½ ft. diameter. Hydraulic power for working cranes and capstans is also provided, in addition to a travelling Titan capable of lifting 30 tons.

From the dimensions of the dock it will be observed that it would contain some 73,000 tons of water, necessitating pumps discharging no less than 540 tons per minute in order to empty it in the specified time.

Surrounding the land upon which the dock has been built a new quay has been constructed, along which railway accommodation and extensive warehouses are to be provided. The easterly portion of this quay will be used for disembarking passengers before the vessels commence to discharge their cargo.

It will be seen from the above description of this important work, that while it is a direct benefit to Southampton, it may be also of great importance to the nation at large, since it is situated in a place capable of being easily defended, and may therefore be found in time of war of greater value than many of our more exposed arsenals.

SURREY ARCHAEOLOGICAL SOCIETY.

THE annual excursion of this Society took place on the 23rd ult., and the places visited were Godalming, Hascombe, Dunsfold, and Chiddingfold. Godalming was the starting place; the church was visited by the Society in 1861, when a paper was read by Major Alfred Heales, which was published with illustrations, in the fourth volume of the Society's "Transactions"; this was not visited on the present occasion. The party consisted of about seventy persons, ladies and gentlemen, and were driven thence to Hascombe. The church here has a wooden porch, which is referred to in Parker's "Glossary."

The company then mounted Hascombe Hill, where a paper, written by Mr. Ralph Nevill, F.S.A., was read by Mr. Mill Stephenson, Hon. Secretary (in the absence of Mr. Nevill from ill health), "On the Topography of the Roman Camp," in which the writer expressed the opinion that the camp on Hascombe Hill was Roman, from its rectilinear formation, and from the discovery, in the neighbourhood, of the Roman villa at Chiddingfold; another reason for concluding the camp to be Roman, was the existence in that locality of the interesting name, Nore, which represented the Roman *Noverca*, a name given to any place adjoining a camp, such as Nork, near Epsom, and many other places. The old church at Hascombe, which had disappeared, possessed that rare feature of an apsidal east end, and it might be that the foundations represented a very early church not unconnected with the settlement of the camp.

Mr. Mill Stephenson said the camp stood at an elevation of 644 ft. above the sea level, and he was inclined to differ from Mr. Nevill in thinking it was Roman, but thought it was of later date. There was, however, but one way of testing these camps, by exploring them with pick and shovel, and, in the meantime, all was conjecture.

After perambulating the camp the excursionists proceeded to Dunsfold, where they were received in the church by the Rev. H. Winn, the rector. Here Mr. J. L. André, F.S.A., read a paper descriptive of the structure. He said little was known of its early history; it was not mentioned

in "Domesday." In the "Returns of Benefices of Pope Nicholas XIV.," the living was valued at twenty marks.

The superiority of the building was due to the fact that the living was given in the time of Edward I. to the Augustinian Canons of the Hospital of St. Mary, Spital, who were fond of noble buildings, but the living reverted to the Crown at the dissolution of the monasteries. The original building was, as now, cruciform, but there appeared to have been no provision made for a tower, either central or western. A belfry was added in the fifteenth century, and with parts of the porch, was the only addition made until the restoration a few years ago, when the organ chamber was added, and still more recently, a vestry. The beautiful tracery of the windows was remarkable in so small a country church in that part of England, and also other features, the doorways being unusually good, the porch door having some excellent ironwork. The chancel arch was a new one, and a niche intended originally to contain the statue of the Virgin Mary had been placed on one side, immediately above a squint, a most unusual position. There were still some curious old seats in the church, and paintings formerly existed on the walls, only one of which now remained.

The Rev. H. Winn asked for an explanation why a portion of an arch in the nave had been left unfinished with a portion of whitewash upon it. He said that in looking over a list of persons repairing the rails of the churchyard he had found several places called "Dene Holes." He was unable to find any such place now existing, and it had occurred to him whether they were similar to the "Dene Holes" which existed in Kent and Essex. He exhibited the register for inspection; in it was a curious certificate of a woman having been buried in wool, as was ordered in former times; also the communion-plate, the latter including a cup dated 1566, and a cover dated 1578.

Mr. C. F. Hayward, F.S.A., said the arch in the nave was left unfinished, because it was originally intended to have an aisle, but for some reason, probably want of funds, this had not been carried out. He expressed his regret that the wall-paintings said to have existed had been lost.

The company were next driven to Chiddingfold, where, in the church, the Rev. T. S. Cooper, F.S.A., read a paper. He said that about twenty-five years ago the Society visited this church, when Major Heales read a paper. This paper will be found published and profusely illustrated in the fifth volume of the Society's "Transactions." The Rev. T. S. Cooper was able to add some additional historical facts not then known to Major Heales, although they confirmed the accuracy of his paper. This church, with that at Godalming, came into the hands of the caputal body of Sarum in early times, and the advowson was granted by Henry I., about 1115, to the cathedral church of Sarum. The Manor of Godalming was granted by Henry II. to the Bishop of Sarum about 1155, the grantee being the then Bishop, Jocelin de Bohun. The original church at Chiddingfold was probably built of timber, but a stone church was erected in 1180. Some glass in a small window in the north aisle, coveal with the oldest part of the church, favoured this early date. It contained the cognizance of the Bohun family, a cross azure, probably put there to commemorate Bishop Jocelin, in whose time the new church was built. In 1290 extensive alterations and additions to the church were made.

The visitors then proceeded to the "Crown Inn," which was to have been described by Mr. S. Welman, Borough Surveyor of Godalming, but in his absence his paper was read by the Rev. T. S. Cooper; the paper was accompanied by some well-drawn plans, elevations, and sections of the inn. Mr. Welman spoke of the building as an excellent specimen of an English hall of early date, but the exact date and builder were not known. The earliest existing record was a deed dated March 20, 1383 (the sixth year of Richard II.), showing it to have been leased by Peter Pokeford for fifty years at 4s. per annum. The original plan was a parallelogram, and was divided internally by partitions into three compartments, a hall 28 ft. by 26 ft., and of one story from floor to roof. At the west end was an inner portion of the hall 15 ft. long, and at the east end was a kitchen. The general plan and features of the building were common to all Medieval buildings of the same kind and period. After exploring the inn, the visitors next inspected the local Institute to view the collection of pottery and glass, &c., found at the Roman villa at Chiddingfold, and thence returned to Godalming.

MAGAZINES AND REVIEWS.*

The *Art Journal* contains an article signed "R. W. J.," and illustrated by Mr. John Fullwood, on "Hastings, Old and New," bringing out effectively the peculiar charm of Hastings implied in the latter part of the title—its mixture of the style of the modern watering-place with the old-fashioned seaside town. "Few places," says the author, "combine town and country, sea-side and hill-side, the historical and the archaeological, as does Hastings." The author, however, does not mention the most charming and characteristic effect of the place, the view from the high down on the east of the old town, on which the whole old town has the appearance of having flowed down by natural gravitation into the narrow valley between this and the opposite hill westward. An article on "The Taking of Tapestry and Brussels Carpets," by "G. W.," recounting a visit to the Dean Clough Mills, Halifax, gives an interesting description, with illustrations, of the process of carpet-weaving. It is stated that the particular manufactory in question turns out six miles of carpet daily. The articles on the "Royal Academy in the Present Century," by Mr. Eaton and the late E. Hodgson, are continued, the present number dealing with the works of William Owen, Rossi, Henry Thompson, Thomas Phillips, Henry Howard, Samuel Woodforde, and Nathaniel Pritchard; all the Academicians in their day, whose names and productions are nearly forgotten now. Thomas Phillips's "Venus and Adonis," from the R.A. Diploma Gallery, of which an illustration is given, is a fine work worthy of being kept in remembrance.

The *Studio* devotes an article to "The Portraits of the Year, by Mr. Frederick Wedmore," with some very good illustrations, and one to Mr. J. Kiviere, in connexion with which a sheet of outline studies of the Polar bear at Regent's Park, caught in a number of different attitudes, illustrates very effectively this painter's practice. We are told it is of sketching and studying animals in various positions—learning all about it before proceeding to work it up into a picture. An article on the Second Manchester Arts and Crafts Exhibition, with a number of illustrations of objects exhibited, conveys the idea that much of the work was to be seen there; some of the designs of furniture of a comparatively simple and are especially good. We do not like to see illustrations of work described as by Morris & Co. Mr. Morris has constantly been preaching the doctrine of bringing forward the work of the craftsman; why does he, of all men, countenance this practice of letting works exhibited as the design of a "company," instead of giving the actual designer's name?

The *Architectural Record* for the September number contains a very good article by Mr. Barrée on *Architecture in London*, in the course of which we are glad to see that full justice is done to our great building the Houses of Parliament, which the writer characterises as "an affair so grandly thought out, so superbly planned, so satisfactory in its masses, its forms, its detail, that one can scarcely realise that it is the work of a single man in the present century." We concur with every word of this and the succeeding comments on this great building, and we must also concur with the writer in the remark that "its immense superiority is even now more recognised by English architects." In regard to the Law Courts, the criticism of which we agree with in general, there is a misapprehension in the statement that the public are not admitted to the great hall and that it is therefore utterly useless; we do not know how the public could have got this impression, unless he had been in the building during the legal recess. If he had gone while the courts were sitting he would have found that every one could walk in and out of it. Of course it is practically useless for its supposed purpose as a *salle des pas*, from not being on the same floor level as courts.

In the *Engineering Magazine* an article on the "Architecture of Railroad Stations," by Bradford L. Gilbert, gives, with the help of numerous illustrations, a good outline of what has been done in this branch of what ought to be, often is not, architectural design. Among designs for small road-side stations those introduced in America are often exceedingly good,

being picturesque without the pretentious style which an English country station building, when it endeavours to be picturesque at all, generally falls into. In regard to great terminal stations we do not consider that an ideal design has ever yet been produced. The hotel type of front only distinguishes a railway station by custom, not by an innately suitable architectural character. In regard to the Gare St. Lazare, of which an illustration is given, it should have been noted that the hotel so oddly placed as a separate block in front of the main façade was no part of the architect's original design, and was thrust upon him against his will, by official order, after the station front had been separately designed and commenced.

The *Artist* contains an article of some interest, by Dr. George C. Williamson, on "Roman Sesterii," considered, of course, from the artistic point of view, in which respect their value seems to us to be much exaggerated; the heads are fine, but the praise bestowed on the figure in No. 12 is absurd. There is a considerable amount of interesting reading and illustration scattered over the number, but in a very scrappy form; a collection of odds and ends without system.

In that eccentric little journal *The Quest*, Mr. George Bayliss gives a historical sketch of Evesham and some of its architectural monuments, and old streets and corners, disfigured rather than illustrated by the imitation of an antiquated and crude style of engraving which seems to be the special fancy of the projectors of this journal.

In the *Atlantic Monthly* Mr. Peabody continues his notes of "An Architect's Holiday," and we recommend his article on French and English churches to the attention of all our readers. They may not agree with it all, but they will be interested to come across an American architect who is not wholly French-mad; who can appreciate the peculiar merits of English cathedrals, and the peculiar fitness of style of English country churches, and who can recognise that there is something in English mouldings and English vaulting superior to any work of the same kind in France.

In the *Fortnightly Review* the thoughtful article by Vernon Lee on "Beauty and Sanity" is a fine contribution to the literature of "higher criticism," in which the want of reserve and purity of form in modern art, its tendency to "intensity" rather than beauty, is dealt with; and though the special instance is mainly drawn from the art of music, the thought of the writer has a wider application than to any one art. Mr. R. A. Gregory contributes an article on "The Spectroscope in Recent Chemistry." Colonel Boxall's article on "Railway Batteries," though a military article, has an interest for every one as touching on improved means of coast defence for this country, and the constructive and mechanical difficulties dealt with have an interest, in another sense, for engineers.

Scraper, in its series on "Wood Engravers," treats of the work of Léveillé, illustrated by a frontispiece which shows a remarkable piece of face-modelling by elaborate line-shading.

In the *Century* Mr. Timothy Cole devotes a little more space than usual to his "Masters of Dutch Art," seeing that this month he deals with no less a personage than Rubens, three of whose works he engraves. That of the lovely "Chapeau de Paille" is a good honest piece of engraving, but a little heavy in effect.

Harper contains an article on "Midsummer Night's Dream," with Mr. Abbey's illustrations; but much as we admire Mr. Abbey's genius, we have long ago come to the conclusion that his work does not lie in illustrating Shakespeare. The only one we like is "Enter Duke Theseus," which has a fine melodramatic sweep about it.

In the *Nineteenth Century*, the Rev. Edmund Ledger's article on "Stars and Molecules" is a very good popular setting forth of that last vast generalisation in cosmic physics, which traces out the same action, the same causes and effects, in the infinitely great and the infinitesimally little in the physical world. Several men of science have treated the subject in magazines of late years; we may recommend this article to the attention of readers to whom the subject is new. Two conjoint articles on "New British Markets," by Mr. Holt S. Hallett on that of China, and by Mr. C. E. D. Black on that of Tibet, may interest those who are looking for new outlets for British labour and production. Miss Sellers describes in another article the "Old-Age Homes of Austria"—a vast improvement certainly on our workhouses, where the merely unfortunate respectable person is grouped with the idle and vicious.

In *London Society* we have the continuation of "Reminiscences of a First Visit to India," by

L. A. L., which gives a picturesque and vivid record of impressions.

The *Gentleman's Magazine* gives an account of "A Visit to Bonifacio" (Corsica), containing some description of the aspect of a place which has not been much described.

In the *Pall Mall Magazine* Mr. Grant Allen continues his series of articles on "Evolution in Early Italian Art," dealing with successive types of the Madonna, and Mr. A. F. Jaccaci contributes an article on "The Palace of Fontainebleau," with illustrations of the forest without and some of the rooms within.

There is no architectural, but some topographical, interest in the *Windsor Magazine's* illustrations of "Houses of Celebrated People." The same number contains an illustrated article on the contents of the Walker Art Gallery at Liverpool.

We have received the first two numbers of the new series of the *Sanitary Inspector's Journal*, the organ of the Sanitary Inspectors' Association. It is well got up, and likely to be useful to those in whose interest it is published. It is issued monthly.

LECTURES AT THE SANITARY INSTITUTE.

In connexion with the British Medical Association, which held its Sixty-third Annual Meeting in London last week, a series of receptions have been given at the Parkes Museum by the President and Council of the Sanitary Institute, which have been fairly well attended. Each evening a subject has been introduced in a preliminary lecture, the first by Sir Thomas Crawford, the second by Professor A. Wynter Blyth, the third by Dr. G. Reid (Staffordshire County Council), and the last by Professor Percy Frankland, each lecture being followed by a discussion. At Dr. Wynter Blyth's lecture, given on Wednesday last week, there were present Sir Robert Rawlinson, Sir Douglas Galton, Sir G. Humphry, of Cambridge, Mr. Rogers Field, C.E., and other eminent sanitarians, the subject of the lecture being "The Teaching of Hygiene as illustrated by the Parkes Museum." The lecturer briefly sketched the history of the Parkes, from its foundation in 1880, as a permanent memorial of the late Edmund A. Parkes, its removal from its first home at University College to its present site, and its subsequent amalgamation in 1883 with the Sanitary Institute. Its usefulness might be illustrated by the fact that it afforded object lessons of the most effective kind to 20,000 persons annually, that during the last nine years systematic instruction in the principles of hygiene had been given within its walls, and that besides the students attending the regular courses of lectures, over 1,000 students, a fair proportion of whom were ladies, from fifty-eight colleges and societies, had received instruction. They could not claim for their institution, that it was a model museum of hygiene. Such a museum would require far more space and an ample endowment in order that it might have complete departments illustrating the appliances necessary for the maintenance of life in the best conditions, in its different cycles, one gallery being devoted to infancy and the *crèches*, another to the school period of life, then to the occupations of the people and the arrangements necessary for the maintenance of health and domestic comfort, and finally to the inevitable period of decay involving the question of cremation and other methods of disposing of the dead. Being in no way subsidised by the State they had to be contented with a gradual growth, and the size and scope of the present building were far below what was felt to be desirable. But thanks to the donations and subscriptions of private members the museum had considerably developed, and within their small building they had, arranged in four groups, a most useful collection of exhibits illustrating the science of hygiene (Division A), others relating to schools, trades and professions (Division B), construction and sanitary apparatus (Division C), which included building materials, construction, machinery, the means of water-supply, sewerage, heating, lighting, and ventilation. Finally they had Division D devoted to personal and domestic hygiene.

In Division C, the most important division of the four, they had drawings of the sewers of London, plans and specifications of model cottages and blocks of dwellings (not always models of what should be imitated), some excellent designs from the *Builder*, many plans and specifications of blocks of improved dwellings in London and the provinces, and many

*The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on views expressed in such articles. When a magazine has been sent to us it is not noticed, it is because that we contain nothing that it is within our province to mention.

models of good and bad sanitary construction. The lecturer pointed out four models of sections of brick walling with and without damp-proof courses, in one of which, where no damp-proof course was laid, the effects of the damp were seen rising high up in the walls. In the others, where damp-proof courses consisting of two rows of slate bedded in cement, or a glazed stoneware course, or an asphalt course laid above the ground-line on the outside and below the ground-line on the inside, no such effects were visible. These illustrations were rendered still more emphatic by an adjoining exhibit, which showed in a striking way in a glass vessel the large quantity of water that a single brick could absorb, and demonstrated that in a damp house, where no damp-proof course had been put in, the walls might contain an enormous quantity of water. Other models demonstrated, by the rising bubbles on the surface of water in a cistern, how foul air was introduced into the house supply of water where the cistern was directly connected with water-closets. One large drawing showed almost all the possible faults of drain construction, and an admirable full-sized model of house-drainage was pointed out, which illustrated how a soil-pipe should be constructed and ventilated with anti-siphonage pipes to prevent the spread of foul air by siphonage in systems where water-closets were placed at different levels. Models were shown to illustrate the methods of testing the tightness drains by the water and smoke tests, and the principles of action of the Pasteur Filter and the Berkefeld Filter, the only filters at present known to be safe where water contained bacteria. The latest addition to the collection of models in the museum is one demonstrating the danger of sewage contamination to a source of water supply even from great distances, where the subsoil is waterlogged. A pump in the middle of the model being set in motion, tubes on the outside of the tank showed, by the various depths to which the water descended, according to the distance of each tube from the central pump, that a hollow cone was formed by the contour of the water, and that any impurity contained within the periphery of the cone must eventually find its way into the water that passes through the pump.

In the discussion which followed, Mr. H. C. Soper (Devonshire), pointed out the danger to public health arising from the fact that sanitary authorities were not compelled to ventilate their sewers as private owners were compelled to ventilate their drains, by pipes having their outlets above the tops of the houses. The sewers were usually only ventilated by openings at the street level, a practice which he thought was responsible for much disease. Dr. Wynter Blyth admitted the existence of the evil in the case of old or ill-constructed sewers, but the danger was but slight where sewers were properly constructed and maintained. The great difficulty sanitary authorities had was to find owners or occupiers of houses who were willing to allow ventilators to be put up against the walls of their houses. They were always unsightly, and by many were considered sources of danger to the inhabitants of the nearest houses. A vote of thanks was accorded to the professor on the motion of Sir George M. Humphry.

The Pollution of Streams.

At the third of the receptions given last week by the Sanitary Institute at the Parkes Museum, Sir D. Galton, V.P., presided, the subject of "Water Pollution" being introduced in a preliminary lecture by Dr. G. Reid, M.O.H., &c., Staffordshire County Council. The lecturer pointed out that the increased pollution of rivers which had resulted from the very improvements realised in the sanitation of towns, demanded an early solution. The benefits to the towns which had resulted from improved land- and house-drainage had not been attained without injury in another direction, for the risk of typhoid-fever now removed from wells had been transferred to rivers. Sewage which formerly dissipated itself in the soil surrounding our houses, or which only found its way into water-courses by devious and numerous channels, now went in a more or less concentrated form directly to the rivers and canals, sometimes without any treatment at all, and generally after very indifferent treatment. On the other hand, the possibility of getting protection from water epidemics by the effective filtration of river water on the large scale had been proved in the cholera epidemic at Hamburg, and it had been fairly well established by bacteriologists that organisms which formerly existed for long periods in the soil perished more or less rapidly in sewage and in rivers. Still, as the law requires sewage to be purified

before being discharged into streams, it was necessary to discover the most available means of doing this, and he (the lecturer) had, during the last three years, made a series of observations with that object. He had collected about 700 samples of sewage effluent and river water at thirteen points of observation, in streams in Staffordshire, where they had twenty-seven disposal-works. The rainfall on the day before, the week before, and the month before, each sample was taken, and the estimated flow of the stream at the time were systematically recorded and tabulated. He had not yet had time to extract from these records all the facts they were capable of yielding, but it was evident to him that the taking of such records in various counties and in foreign countries was likely to be of great future value. From these analytical results, combined with information acquired in his periodic inspections of the sewage disposal works themselves, he had arrived at the following fairly positive conclusions, which he presented not as an authority on the subject but merely as a humble student:—

(1.) Precipitation followed by land filtration gives the best results, provided that the land be suitable, and that it is properly prepared and efficiently managed.

(2.) That whatever may be the true explanation, the best effluents are derived from land which is deep drained.

(3.) That land properly used will do its work efficiently for an indefinite period, but if sewage in excess be applied, or if insufficient intervals for aeration are not provided for, the results will rapidly deteriorate.

(4.) That the needless volume of sewage received during periods of rain is a common cause of failure. A separate system of sewers should be established, and the dilution should be effected by properly arranged flushing tanks, and not by uncertain rainfall.

(5.) Profit must be subservient to efficient disposal, and the land should not be sub-let to farmers, where the sewage works are at all extensive.

(6.) That in artificial filtration, polarite and magnetone do not possess any specific power of disintegrating sewage by mystic processes, but that they act merely as air-carriers, and so contribute to the growth and activity of the nitrifying organisms, which, with proper use, develop in their interstices.

The exhaustive experiments of the Massachusetts State Board of Health showed how effective was sand-filtration, and possibly the efficiency of sand-filtration might be increased by artificial aeration of the filters. Any system must prove a failure which aims merely at the precipitation of the solids and the disinfection of the effluent. To be satisfactory a filter must aim at producing as thorough a nitrification as possible. The lecturer suggested, in conclusion, that investigations such as those he had recently begun should be multiplied, to ascertain the nitrifying power of various soils at different depths, and that the nitrifying organisms should be carefully studied in order to arrive at as accurate a knowledge as possible of their life's history.

In the discussion which followed, Dr. Whitelegg said he thought a great deal of the efficiency of sewage disposal works depended on maintenance as well as on first construction. Some worked only eight hours a day, and not at all on Sundays. Sewage works should be kept going night and day, and certainly on Sundays as well as weekdays, and there should be a power of entry upon the premises and compulsory inspection. On another point he said, many instances were to be found in Yorkshire of self-purifying streams. He found the sum total of filth at the lower part of such streams by no means so much as that which went in. It became deposited in banks and fore-shores, and was not purified at all. It should be diverted into drains and sewers, but in that case they would impoverish the streams.

Major Lamorock Flower agreed in the remarks of Dr. Whitelegg in regard to the importance of good maintenance as well as good construction.

Mr. J. W. Peggs said that another Act was absolutely necessary, the existing Rivers Pollution Act being almost unworkable.

Mr. Scott Moncrieff, referred to the varied and opposite opinions held by experts, in Germany, on the subject of the self-purification of streams. Pettenkofer advocated stricter sanitary regulations and more perfect systems of drainage, while Dr. Buchner declared that the River Issa, a tributary of the Danube, was capable of purifying the sewage of Munich so completely that there was no necessity for sewage works at all.

Dr. Reid replied to the various points raised in the discussion, and on the motion of Sir Douglas Galton a hearty vote of thanks was accorded.

Microbes in Water.

The fourth lecture at the Parkes Museum was

given by Professor Percy Frankland, of Mason's College, Birmingham, the chair being taken by Professor Sir G. Humphry, of Cambridge. Professor Frankland read a short paper in which were described some of the leading results obtained in experiments made by him to ascertain the comparative numbers of microbes to be found in deep well or spring water, in water comparatively pure like that of Loch Katrine, water much less pure like that of the Thames, and in so-called purifying streams, of which the Dee in Scotland was a typical example. In Thames water from 1,000 to 120,000 microbes might be found in every cubic centimetre, while in deep-well water the number might be reduced to ten, or under. In the analysis of samples of water taken from the Dee, above Braemar, it was found to contain only eighty-eight microbes per cubic centimetre. But taken again after receiving the sewage of Braemar, they had increased to 2,820 per cubic centimetre. In a sample taken some miles lower down, they were reduced to 129 per cubic centimetre, and further down still, after more sewage had been turned into the river, they had again risen to 3,780, and once more some miles away they only numbered 938 per cubic centimetre. This demonstrated that a stream might be repeatedly polluted and then be found repeatedly purifying itself. The purifying effects of sedimentation and storage were illustrated by experiments made ten years ago on London water, and the lethal power of sunlight, which was known twenty years ago, was discussed. The efficacy of the film or layer of slimy silk in filtration was pointed out, from which the rule was deduced that the materials in a filter should not be changed oftener than was necessary. Softening water by Clarke's process eliminated 98 or 99 per cent. of its bacteria. The most modern filter with one or two exceptions did not remove bacteria from water, which it was still as necessary as ever to boil.

A question as to how far down below the surface of water the lethal rays of the sun might be found operative, elicited from Professor Frankland an interesting statement. Dr. Buchner, of Munich, he said, had found that sunshine retained its destroying power over bacteria in the deep pellicular water of the Sternberger See to a depth of 10 ft., but the observations of Dr. Boccace in experiments with turbid water were still more important. The latter experiments had found cholera bacteria destroyed in the upper strata of a cylinder 18 in. deep, but that they were not affected in the lower strata. The general tendency of the lecture was to restore public confidence. There was much less danger to public health in the water we drink than bacteriologists had led the public to think.

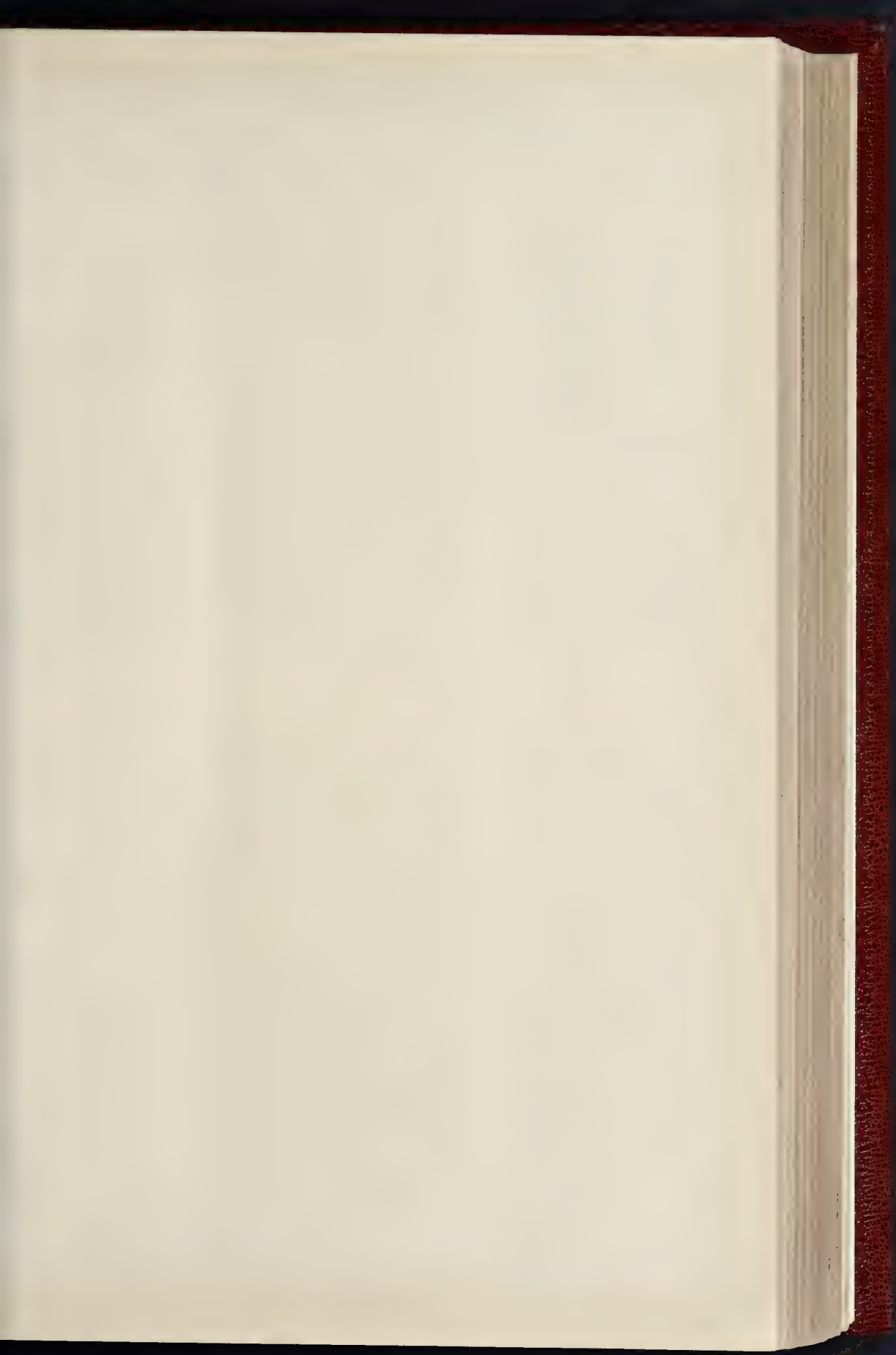
A cordial vote of thanks was accorded, Dr. Percy Frankland's father, Dr. Frankland, the veteran analyst, being included in the proposal of thanks, which was made by Sir Douglas Galton.

Illustrations.

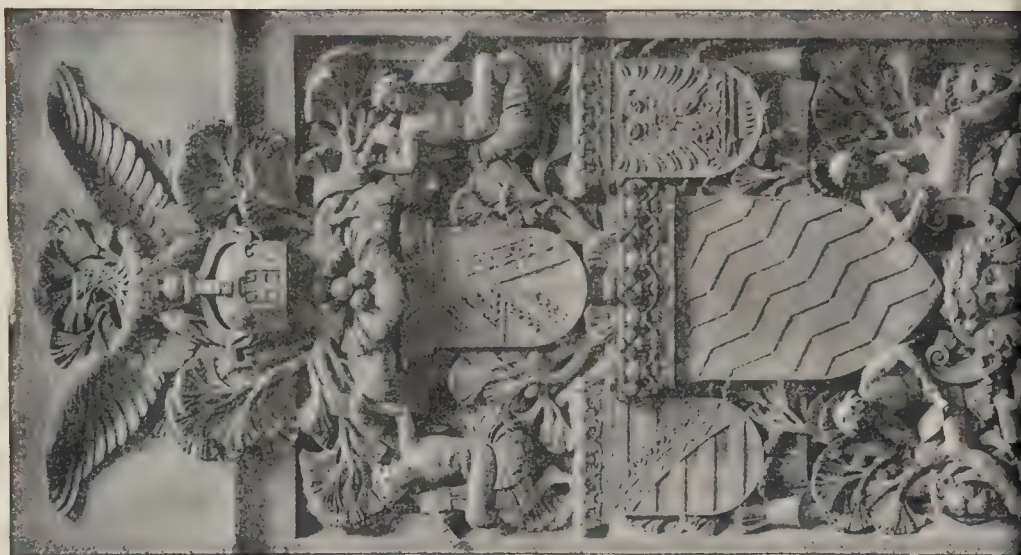
OUR illustrations this week are entirely concerned with the Berlin House Bill, introduced in Parliament, and are from drawings lent to us by the architect, Herr Wallot, for the purpose. They include a perspective view of the exterior, from a drawing by Herr Gustav Halmhuder; a perspective view of the south entrance vestibule and staircase; the elevation of one side of the Council Chamber (the centre line is marked on the drawing); from the architect's working drawing; and reproductions from photographs of the carved panels on each side of the main entrance.

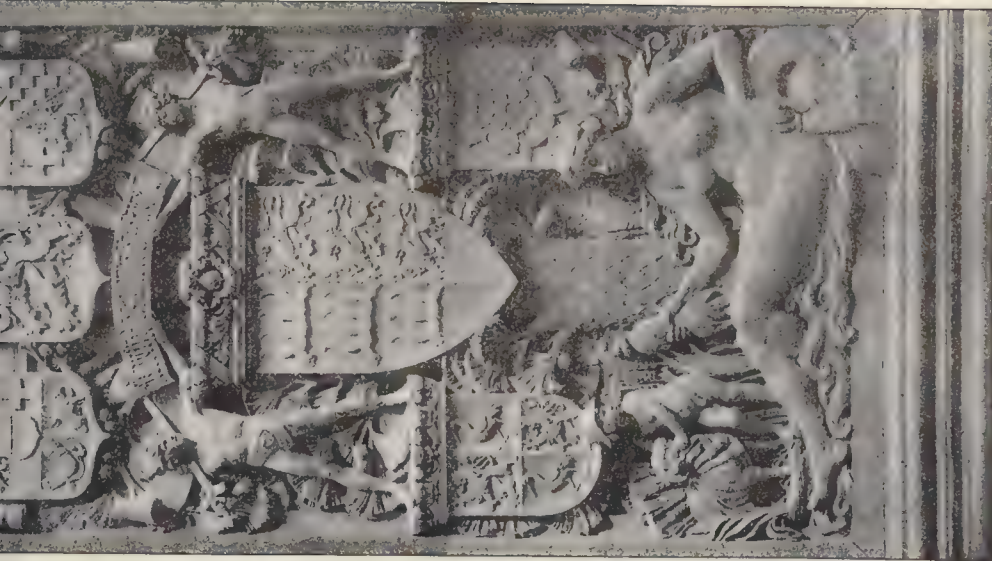
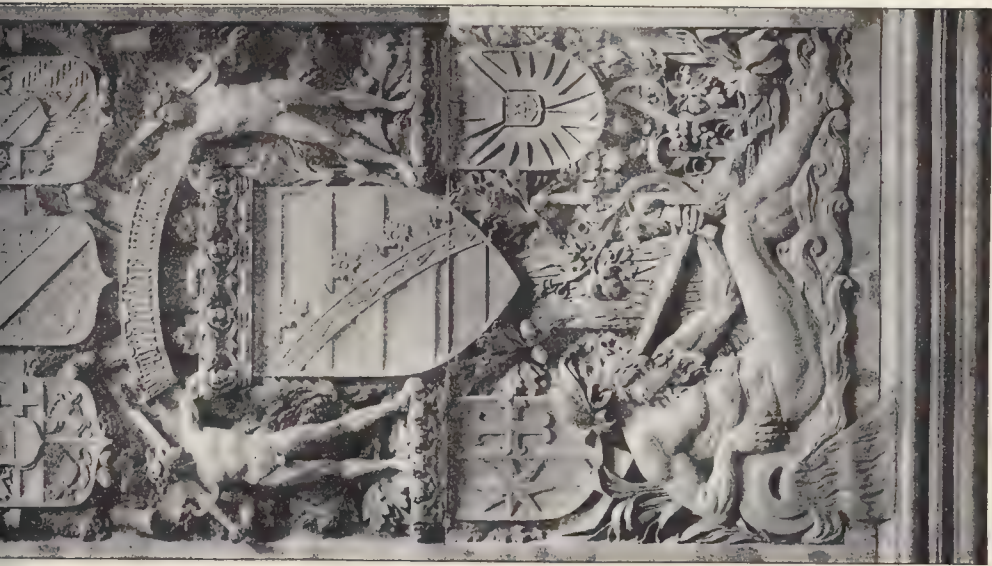
The subject is further referred to in the first article in this week's issue.

GRAY'S INN.—The block having been condemned by the London County Council, the entire west side of Field-court has recently been demolished for rebuilding. The court is included in a survey made for the Benchers in 1688, and is mentioned, though not by its name, in Strype's "Survey," 1720. It is probably so named from its vicinity to Red Lion-fields, where Red Lion-square was built in 1698; yet we may mention that the row leading from the west gate of the Inn, in Warwick-place, to Theobald's-road, parallel with Raymond-buildings, is called "Jockey's-fields." An old thoroughfare from Field-court through Fulwood's-tennis to High Holborn, has been closed for several years past. A view of the buildings which have thus been cleared away will be found in "Gray's Inn: its History and Associations," 1886, by Mr. W. Ralph Douthwaite, Librarian to the Society.

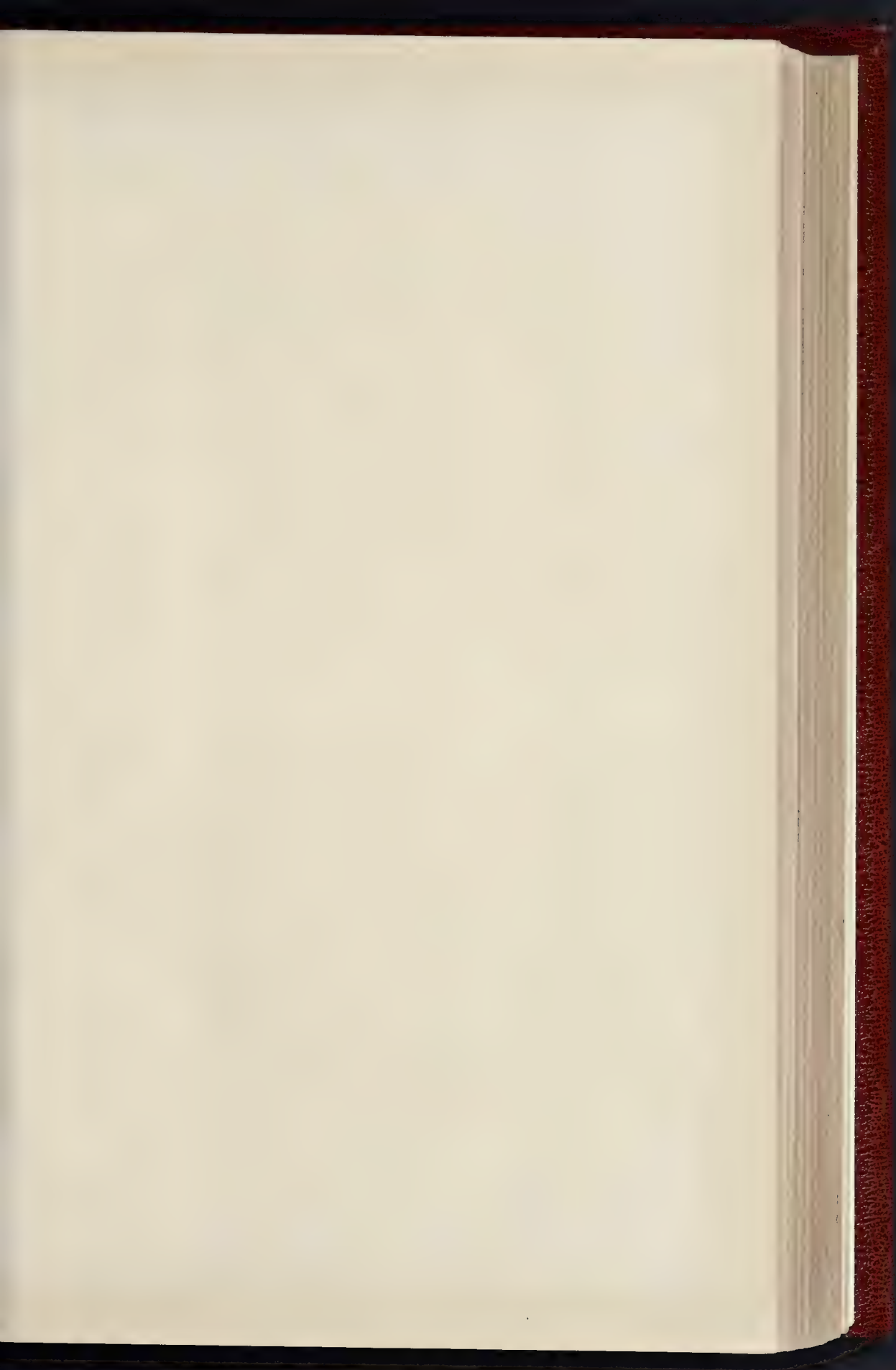


THE BUILDER, AUGUST 10, 1895.





IMPERIAL HOUSES OF PARLIAMENT, BERLIN.—PROFESSOR PAUL WALLOT, ARCHITECT.
SCULPTURED PANELS AT SIDE OF MAIN ENTRANCE.



IMPERIAL HOUSES OF PARLIAMENT
HALF ELEVATION OF ONE

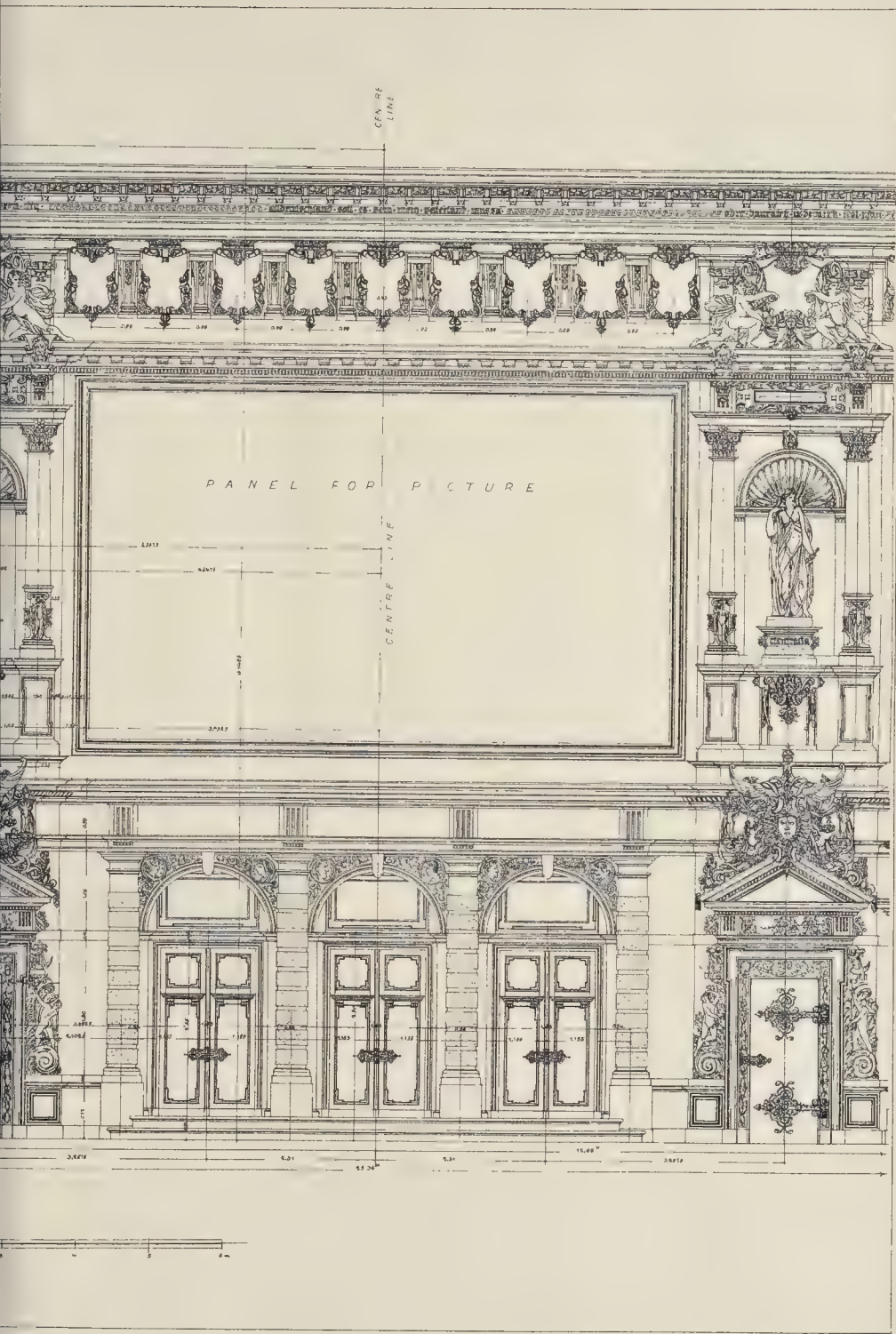
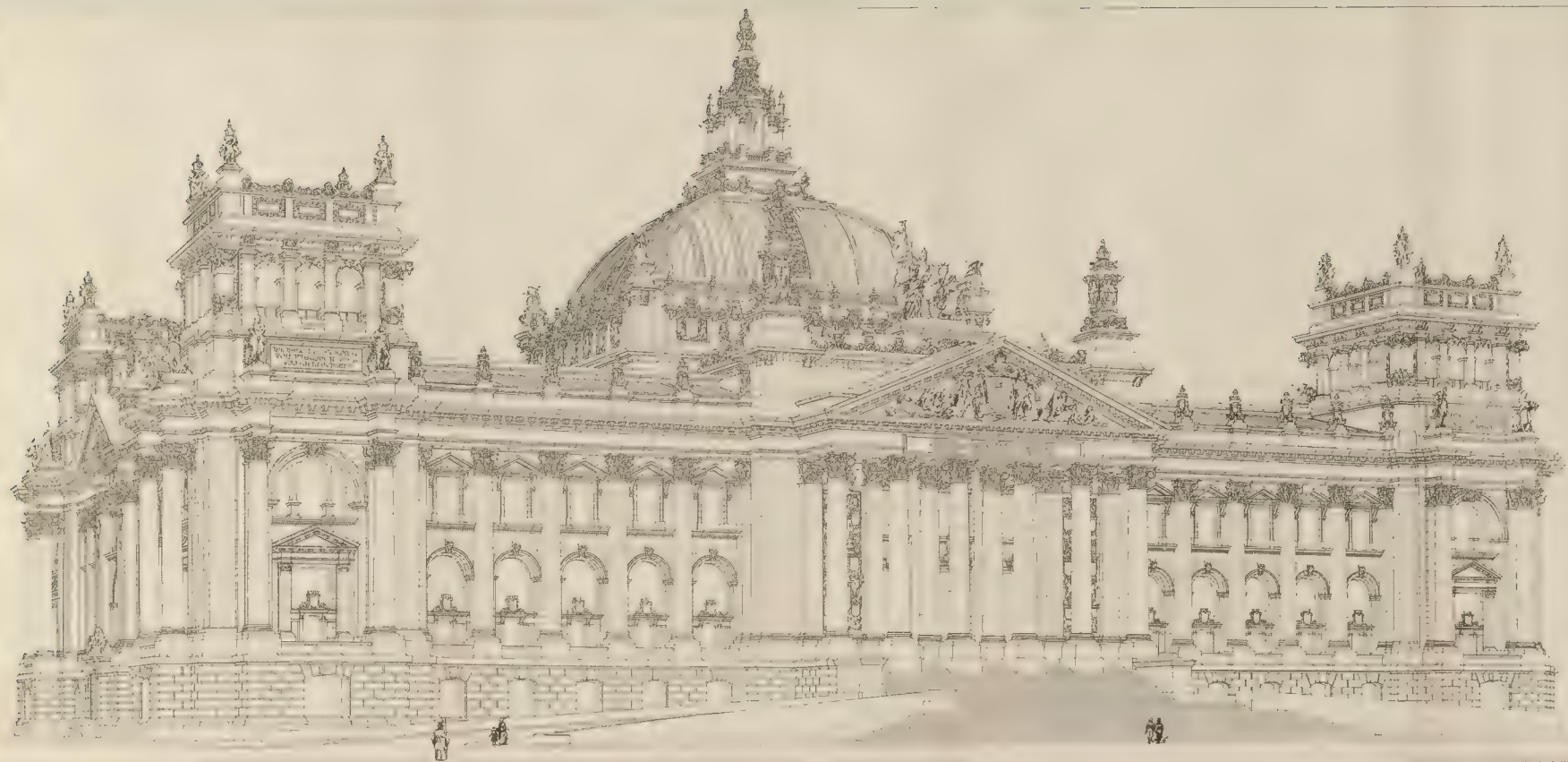
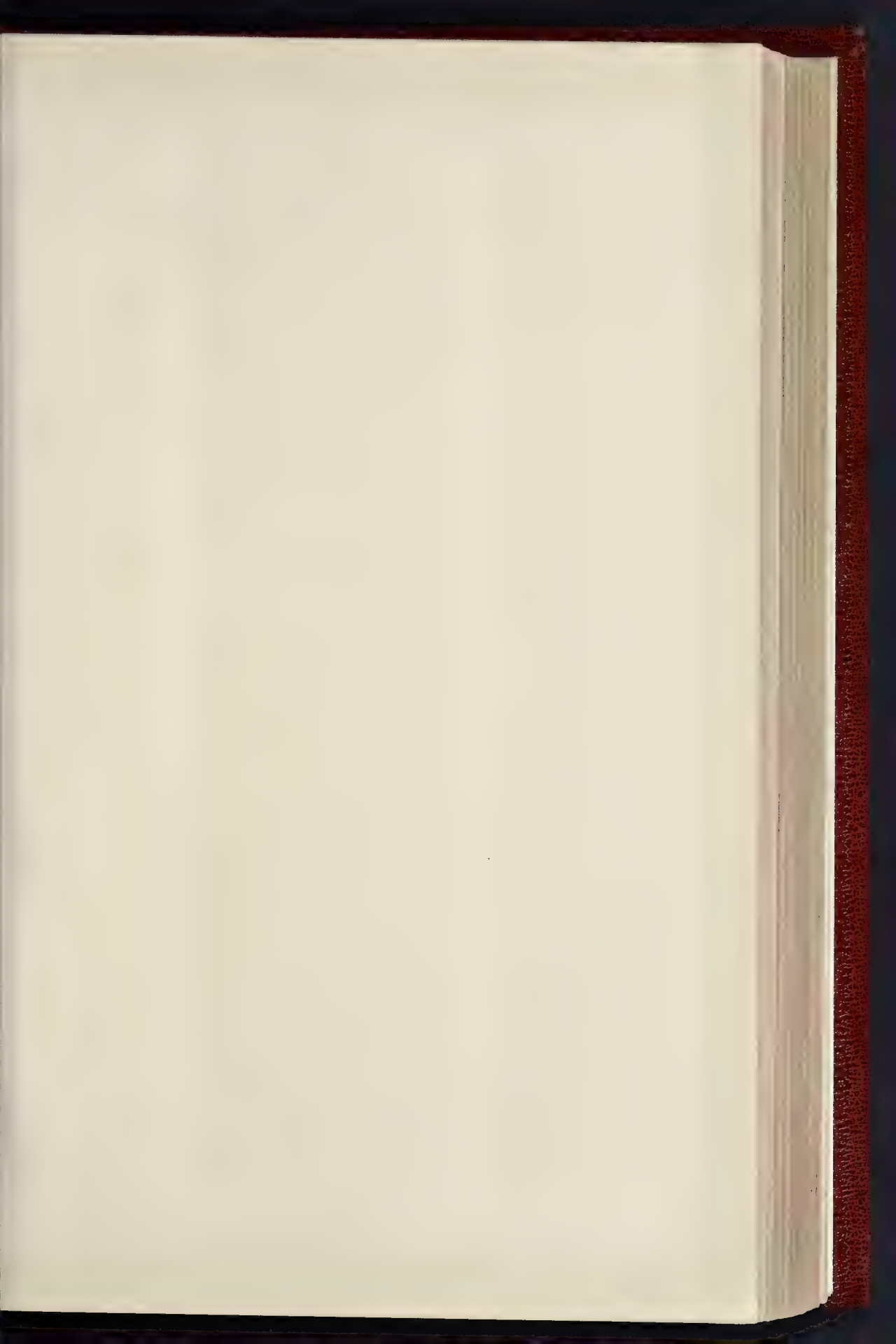
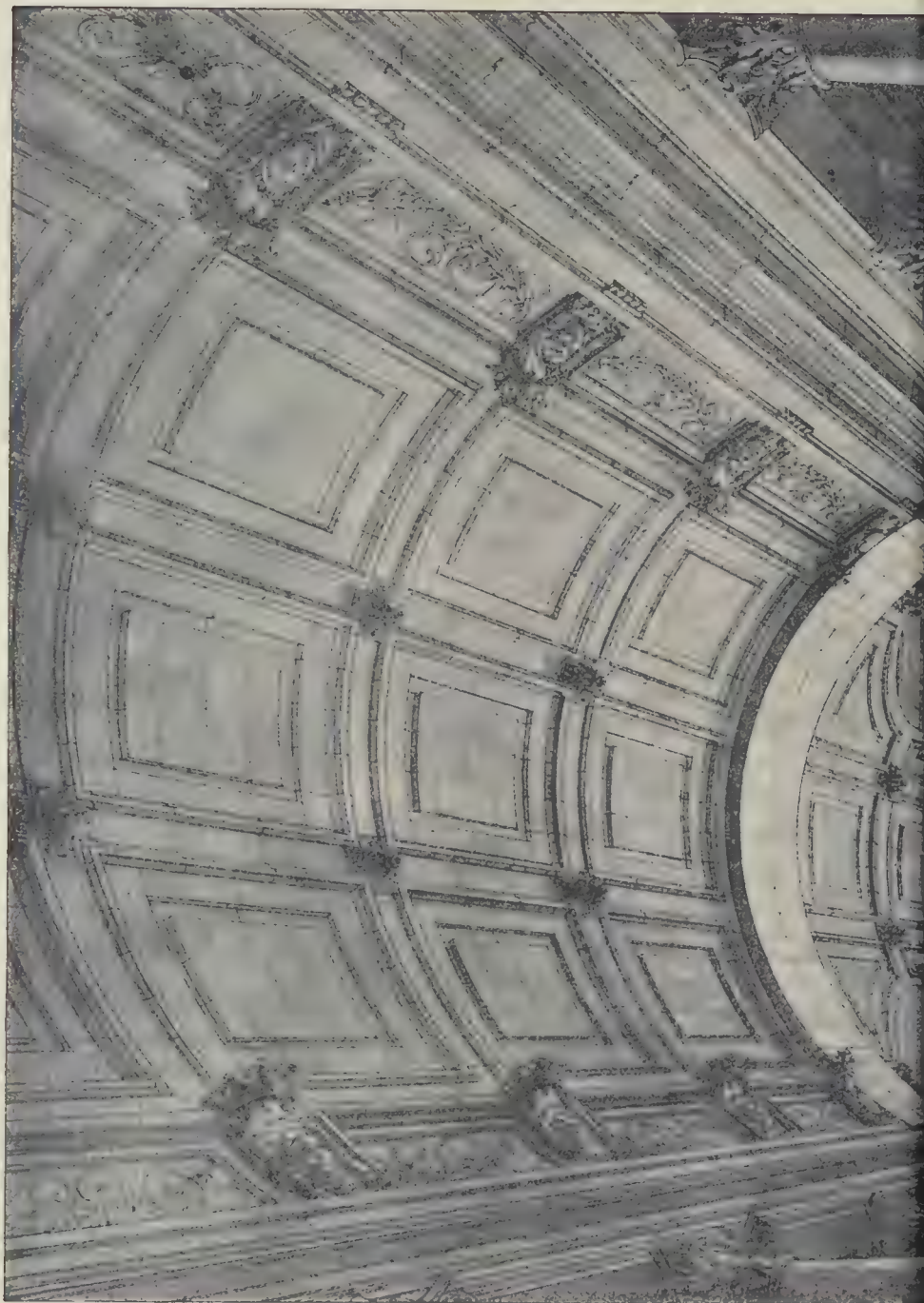


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THE BUILDER, AUGUST 10, 1895.





IMPERIAL HOUSES OF PARLIAMENT, BERLIN.—PROFESSOR PAUL WALLOT, ARCHITECT
VIEW IN SOUTH ENTRANCE HALL.



Imperial Houses of Parliament, Berlin: Professor Paul Wallot, Architect.—Detail Elevation of Angle Pavilion.

Correspondence.

To the Editor of THE BUILDER.

KENSINGTON AWARDS.

SIR,—In your issue of July 27 you give a notice of the works for "National Competition, 1895," now on exhibition at South Kensington, and you say "the architectural work, as a whole, does not arouse our admiration, and if the work exhibited is representative of the South Kensington method of teaching architecture, the sooner those methods are improved the better." For these pregnant words the best thanks of all the students are due.

If, however, the *Builder*, speaking with an authority that cannot be questioned upon its own special subject, finds it necessary to suggest reform in the technical teaching or in the judgment of awards with regard to architecture, may it not also be the case with regard to the other departments of this colossal institute, which does not teach, but leaves both masters and students to flounder on year after year without any intimation or fixed standard of its requirements?

May it not be more safely said that South Kensington teaches nothing, it only administers large sums of public money in the most erratic fashion, and if this be so, surely it is time to demand a sweeping reform, and that it should really become the National Technical School.

If you would kindly find space for this letter, many hundreds of students, together with puzzled masters, would, I am sure, feel grateful.

Aug. 4, 1895.

"MIDLANDS."

HOW IS AN ARCHITECT'S WORK TO BE PLACED BEFORE THE PUBLIC?

SIR,—When one sees in a professional journal a discussion on the representation of architects' work at the Royal Academy, one is instinctively led to ask the question what form of exhibition could really represent the men and their work in this particular business and enterprise called architectural practice.

Some members of the profession, in the recent expression of their opinions on this topic, seem to have evidenced a condition of mind which must strike the ordinary and less excited practitioner as a strange revulsion of feeling, on the validity and representative powers of so-called architectural pictorial draughtsmanship.

It would indeed appear that it may now be accepted as a settled dogma, from those most capable of judging, that while architectural perspective representation is a right and proper vehicle of architectural expression, covering a large area and degree of architectural power and language, it is very far from telling the whole truth, and portraying the full scope of an architect's worth and power.

It would I think be instructive to set opinions on the question, not only as to architects' work as exhibited at the Royal Academy but on the far wider one: Can architects' work be publicly exhibited at all?

One is ever apt to suffer a large disability in any discussion of this kind, from the circumstance that as soon as one evinces a disinclination, however honest and well founded, to disregard the power of architectural pictorial representation, such an opinion breeds the tacit conviction, with those holding a contrary view, that the architect, not being one who himself possesses this much-coveted power, is stupidly unwilling to allow its possession and force in others.

It is therefore most refreshing to discover, from the opinions of your correspondents, that there is a growing feeling amongst even those who ostensibly possess this power of facile and successful presentation of their work, to consider this feature as very far from being the touchstone of all architectural attainment and ambition.

I take it to be quite possible for an architect to be able to study all his work in perspective as occasion may require, and yet for that architect not to be able to produce a finished perspective presentation of his work that should satisfy himself let alone those critics who have themselves become specialists and successful performers in this particular art.

However much some may clamour and insist that it is possible to practise as an architect without some amount of artistic education and aptitude—and most of us surely are aware that many men do so practise who possess neither the one nor the other—it must, I think, be conceded that individually such men are ever placed at a disadvantage which no one admits more freely than themselves.

At the same time, and giving allowance and precedence to this admitted form of professional aptitude, there are surely so many other issues, so many other features, which go to make up the every-day life of architectural practice, that I very much question if, as the years go by, one is not, perforce, bound to consider this special path of one's work as absolutely swamped and crowded out by other more numerous and pressing considerations. Naturally one wishes it was not so much so; but

the fact remains, and in the face of the multitude of duties an architect is called upon to perform, it does not seem either easy or just to specialise any one of them as expressive of the particular fitness of an architectural practitioner.

We must be free from cant at all times, and I am strongly inclined to the view that a large majority of practising architects—men who have spent their youth in earnest study and who have a fair record to show that they may be considered well educated and expert as draughtsmanship goes—will have to confess that they use this form of their professional language less and less every day they live. It is after all and at the best only a language—only a means to an end.

It is always unsafe to descend to small details in discussing generalities, but I hope I am not singular in finding myself forced to the conviction that there is often more skill required, more knowledge demanded, more judgment and care necessary, in some unpretentious alteration and reconstruction, if it be done scientifically and well, than in many a more ambitious and showy work.

After all, the most urgent question for the public in this matter is the selection of an architect who is best able to spend their money in the best way, not in the cheapest, not in the plainest and ugliest way, not in the most costly and extravagant way, but in the way that has regard and affinity at all times to the special fitness and circumstances of things. A man of honour, of integrity, sound judgment, good common sense, technical skill, and fair scholarship. I fancy some of your readers, like myself, would be glad to know how such qualities as these, which many possess in high degree, who are not necessarily great at architectural pictorial representation, can be placed before the public for their early selection and ultimate retention.

"A COMMONPLACE PRACTITIONER."

The Student's Column.

METALS USED IN BUILDING.—VI.

THE PRINCIPAL ORES (continued).

PLATINUM.—There is only one ore of this metal, viz., native platinum, but it is frequently alloyed with very rare minerals from which it has to be separated. These latter are worth mentioning from the circumstance that some of them, owing to the fact that they can now be readily reduced, will undoubtedly play a more conspicuous part than hitherto in the preparation of various manufactured articles and alloys. The principal metals of the platinum group may be cited as platinum, palladium, rhodium, osmium, ruthenium, and iridium. Platinum also occurs with gold, copper, lead, and nearly always with a fair proportion of iron. The ore is usually found in sand in the form of thin scales, large grains, and, very rarely, large lumps. Typically it is white, and does not tarnish on exposure to air. It has a very high specific gravity (up to 19), and fuses with great difficulty, points which serve to distinguish it from other metals. It is an extremely valuable metal; its principal uses depend upon its resistance to the action of heat, of oxygen, and of acids; it is ill-adapted to resist ordinary wear on account of its softness. A remarkable property of the metal, especially when in the forms of "spongy platinum" and "platinum black," consists in the power of condensing gases into its pores, promoting their chemical action upon one another, and this has received a striking illustration within the past few months in connexion with gas lighting (see *ante*, p. 36). Platinum is found in small quantities in two or three localities in South America, and more extensively in the Ural Mountains. At Evan's Heat, in New South Wales, it has been discovered in payable quantities in sand on the sea-shore. Near Broken Hill mines, in the same colony, it is found in a lode associated with silver, copper and other minerals, and, according to assays of concentrates, the ore yielded from 10 to 16 dwts. of the metal per ton. The concentrated beach sand gave 4.3 per cent. platinum and 13.58 per cent. of tin ore. Grains of native platinum have been found in small quantities amongst the native gold of Rivière du Loup and neighbouring districts in Quebec; whilst on Tranquille river in British Columbia scale-gold is mixed with particles of platinum of similar shape and size. A certain amount of the metal is obtained from placer gold washings on the Pacific slope of the United States; at Port Orford and Randolph it occurs in the "black sand" mines on the sea-beach. Platinum has been observed in river-sand in Co. Wicklow, Ireland.

Uranium.—The principal ores of this metal, which is rare in nature, are—pitchblende, or

uraninite, uranic ochre and uranite. The first mentioned is the proto-peroxide of uranium, and usually contains about 10 per cent. of lead and silica; the second, which occurs in an earthy pulverulent condition, of a lemon yellow or orange colour, is the hydrous sulphate of peroxide of uranium, generally with small quantities of lime, copper, and iron; the third embraces two species, *copper uranite* (or uran-mica as it is sometimes called from its superficial resemblance to mica), hydrous phosphate of uranium and oxide of copper; and *lime uranite* in which hydrate of lime takes the place of copper. Speaking in general terms, uranium is a white metal which does not oxidise in dry air, but if the temperature be elevated it oxidises rapidly, burning with a bright flame. The oxides of uranium are used, amongst other things, for staining glass, the uranous acid (UO_2) giving a deep black, and the uranic acid (U_2O_5) a bright yellow. Uranium is found in small quantities in many parts of the world. The ore has occasionally been met with in mines in the parishes of St. Just, Gwennar, Camborne, Illogan, Redruth, St. Agnes, St. Stephens, and St. Austell in Cornwall. Small proportions of pitchblende were, a few years since, collected at Wheal Owles and East Pool mines, and more recently some lime uranite has been found at South Terras. The only mine at present worked in the United Kingdom is at Grampond Road, in Cornwall, and this is exploited solely for its uranium ores.

Tungsten.—The principal ores of this metal are:

1. *Wolfram*, tungstate of iron and manganese (tungstic acid = 75 per cent.).
2. *Tungstic Ochre*, or wolframite, an oxide containing 79 per cent. of tungsten.
3. *Scheelite*, tungstate of lime with from 76 to 80 per cent. of tungstic acid.

The first-mentioned is by far the most important ore; it is commonly found in a massive condition associated with tin-stone, is of a greyish-black colour, and has very variable proportions of iron and manganese, the iron sometimes being as high as 30 per cent. and the manganese 14 per cent. Wolfram is found in all the mining districts of Cornwall, and is especially abundant along the northern side of the Carn Menellis granite. There is only one mine, however, East Pool, which produces any large quantity of the mineral. In reference to tungstic ochre, it occurs in a pulverulent and earthy condition, and results from the alteration of ores of tungsten. It is of a bright yellow, or yellowish green colour, and is composed of pure tungstic acid. Scheelite forms an ore in New South Wales, and is found near Keswick in Cumberland, Cornwall, Devon, the Harz, &c. Tungsten is used in small quantities for hardening steel; also for solidifying plaster of Paris.

Titanium.—This metal is not important to us except when regarded in connexion with ores of iron (*ante*, p. 15). By itself it is chiefly employed to impart a yellow colour to ceramic ware. It is a greyish metal, somewhat resembling tin in appearance.

Chromium.—This is one of the most infusible substances known, surpassing even platinum in that respect. Its applications are very numerous. Chromium is used to a limited extent for hardening steel; its sesqui-oxide for imparting a green colour to glass; chromate of potash is employed in the production of chrome yellow paint, &c. There is practically only one ore of the metal, viz., *Chromite*, or chrome iron-ore, which is commonly found in a massive condition. Chemically it is chromate of iron, alumina, and magnesia, with from 45 to 65 per cent. of the sesqui-oxide of chromium. It does not occur in any great quantity in the British Islands, being found mostly in Turkey and Greece; also in Spain, and at Dubostica mines in Austria-Hungary, the provinces of Perm and Orenburg in Russia, the United States, and New South Wales. It is chiefly associated with serpentine, the ore crops out along the foot of the Sierras of the Pacific Coast of the United States, but contains less than 47 per cent. of the sesqui-oxide. There it is always found in pockets, the most important mine being situated near San Luis Obispo, in California. The deposits of chromite at Gordonbrook, near Copmanhurst, in New South Wales, occur in serpentine, a short distance from the Coal Measures. An igneous rock (epidiorite) is penetrated by this serpentine, and the chromite is found at and near the points of contact. The ore yields from 40 to 55 per cent. of sesqui-oxide of chromium. We may remark that the so-called "verdi antico" serpentine, largely used for decorative purposes, derives its green colour from chromite.

In addition to the patients' blocks, there is a complete administrative department, comprising committee-rooms, offices, kitchens, stores, dining-hall, workshops, bakery, visitors' room, club-rooms for attendants, and apartments for the medical and other officers. There is also a new laundry, isolation-hospital, recreation-hall, chapel, superintendent's residence, head attendant's house, ten cottages for attendants, and entrance-lodge. The buildings will be lighted by electric light, and the motive power required for driving machinery, ventilating fans, &c., will be electric. A complete electric plant is to be provided. The foundations,

als, their Properties and Treatment," 1894, p. 221.
"Mineralogy," 1876, p. 145.

and the erection of the main buildings to the ground floor line have been carried out by Mr. John Ferguson, of Newcastle, and the contract for the superstructure and auxiliary buildings has been let to Mr. Walter Scott, of Newcastle, who is now proceeding with the work. The heating and ventilation will be carried out by Messrs. Ashwell & Nesbit, of Newcastle and London; the electric light fittings, wires, and cables by the Corlett Electrical Engineering Company; and the sanitary fittings throughout are to be of Doulton's manufacture.

PROPOSED NEW CONSERVATORY FOR WOLVERHAMPTON PARK.—It is proposed to erect a new conservatory in the park at Wolverhampton, from designs by Messrs. Thomas H. Mawson & Gibson, park architects, of Windermere. The building is designed to figure as a park pavilion externally, therefore the brick and terra-cotta pilasters and the brick porches are intended to give the building a more substantial appearance than horticultural buildings in general; and in order to obviate the difficulty and expense of roof repairing and painting.

CHURCH SCHOOLS, WEDNESBURY.—The cornerstone of a new girls' department in connexion with St. Bartholomew's Church Schools, Church-hill, Wednesbury, was laid recently. The new buildings are being erected adjacent to the old schools, and with alterations which are contemplated to the latter, accommodation will be provided for upwards of 300 children. The work is in the hands of Messrs. Morris & Atkinson, Birmingham, whilst Mr. J. H. Gibbons, of Birmingham, is the architect.

SUNDAY SCHOOLS, WOLVERHAMPTON.—The memorial stones have just been laid of the new Primitive Methodist Sunday Schools, situated at the rear of the Dudley-road Chapel, Wolverhampton. The architect is Mr. M. Johnson, of Wolverhampton, and the contract for building has been let to Mr. J. Jones. The new building will consist of a main room 58 ft. in length, 30 ft. in width, with four class-rooms, opening by folding wooden partitions into the main room.

POST OFFICE, GALASHIELS.—The new Post Office in Galashiels was opened on the 2nd inst. The new building has cost upwards of 5,000*l.*, and occupies a central position at the head of Channel-street. The building is of white sandstone. The public room on the ground floor is 39 ft. by 22 ft., with the postmaster's room, telephone, silent room, and letter reception rooms at the side. In the back division, lighted from the roof, are the sorting-room, 40 ft. by 34 ft., the telegraph and telephone, male clerks and message boys' rooms, telegraph stores, battery and linesmen's rooms. The first floor to the front is to be reserved for future extension. The architect was Mr. Robertson, of Her Majesty's Board of Works.

ST. JOHN'S CATHEDRAL, NEWFOUNDLAND.—The *Evening Herald* (Newfoundland) gives a description of the reopening of the choir and transepts of the cathedral dedicated to St. John the Baptist, on June 29. It will be remembered the building was almost entirely destroyed by fire in 1852. Triumphant arches were erected on the occasion of the reconstruction in the thoroughfares leading to the cathedral. The work generally has been carried out under the personal supervision of Mr. Wills (who acted as clerk of works of the original building), and from the designs of Messrs. George Gilbert Scott and John Oldrid Scott, of London. Most of the internal fittings are special gifts. The oak eagle lectern is a reproduction of the burnt one. The carved oak bishop's throne, sedilia, and stalls, as well as the lectern, are being carried out by Messrs. Harry Hens & Sons, of Exeter, but have not yet arrived. There is also a new pulpit and altar.

SANITARY AND ENGINEERING NEWS.

A SANITARY EXHIBIT AT KING'S COLLEGE.—During the British Medical Congress, held at King's College last week, a comprehensive exhibit of sanitary appliances was shown by Mr. John Jones, of Chelsea. Among the exhibits we noticed the patent drain and pipe stopper, which consists of a bag which is inflated by a small hand-pump, and quickly filled with air under sufficient pressure to dam the drain, and prevent any escape of water. It can be folded and carried in a small space, and can be placed in syphons, gulleys, &c., where other stoppers are difficult to insert. The expanding screw stopper, fitted with indicator, enables the fall of a drain to be accurately gauged. The hand smoke-generating machine, for testing soil-pipes, is also useful and seems simple in action. The air-tight manhole covers shown by Mr. Jones, and to which the medal of the Sanitary Institute has been awarded, is an improvement on the ordinary patterns. It consists of an inner and outer cover. The inner cover is arched, which allows the moisture from the drain to rise to the apex of the arch, where it condenses and runs down to the groove prepared for its reception, into which the cover fits, thus forming an air-tight seal. The top or outer cover is flat with the surface of the ground, and also fits into another groove filled with any suitable material, and held in place by screws in the usual way. Other forms of double-seal manhole covers are shown. An invention in mica valve-inlets is also shown, which appears to work satisfactorily. The valves are hung as a pair of folding-doors, and by this means the direct weight of the valves has

not to be overcome when they open, as each part of the valve has merely to turn on its pivot, whilst the inclination of the axis is sufficient to ensure the closing of the valves on a return current of foul air; and it also gives a full area of air-space. The patent channel-bends for use in inspection-chambers to prevent splashing are a novelty, and are bridged across the outlet, thus preventing the deposit of sewage on the benches and walls of the chamber. The "Sydney Syphonic Cistern" is on new lines; a double coil of syphons is used, one larger than the other, but oval-shape in section, with 3-in. pipe from the larger of the two coils; on this pipe a push-valve opens into the down-pipe, and, by pressing in this valve, the action is at once started, the difference in size of the pipes causing a powerful flush.

SHREWSBURY WATER SUPPLY AND MAIN DRAINAGE.—At special meetings of the Town Council held last week it was decided to carry out the schemes for the new water supply of the borough, and the interception and disposal of the sewage, prepared by Messrs. John Taylor, Sons, & Santo Crimp, of Westminster. The water scheme involves the construction of a large impounding reservoir, together with the necessary filter-beds, pumping-station, service reservoir, and necessary mains for obtaining a Severn supply. As regards the main drainage, it is proposed to carry out a complete system of intercepting sewers which will discharge at a central pumping-station, from which the sewage will be pumped to land for purification. The schemes are estimated to cost about 85,000*l.*, exclusive of the cost of land.

MISCELLANEOUS.

SWISS BUILDING-MATERIAL TESTING STATION.—According to a recent report of the United States Consul at Zurich, the object of this institution, a branch attached to the Federal Polytechnic School at Zurich, is to ascertain the general utility of building-materials, especially as to their cohesive power, in compliance with requests made by authorities or private persons. In addition thereto, it makes of its own accord examinations and tests of the same nature which, in a general economic and scientific way, are of public interest. Every kind of building and constructive material is tested, but particularly natural and artificial building-stones, cements, chains, driving-belts, hemp and wire cables, metals, as well as completed constructions, parts of machinery, or bridges, to ascertain the quality of materials, their elasticity, and absolute strength. The station furnishes also chemical analyses of these materials. The institution is placed under the direct supervision of the Federal School Board. The tests of building timbers are: Indication of run of fibres, number and condition of knots in longitudinal cuts, determination of the average width of annual layers, and modification in width thereof in a latitudinal direction of the structure, composition of the lineal layers, as well as the average proportion between spring and fall woods; determination of the degree of moisture, the density at the time of delivery, and after being subjected to a temperature of 221 deg. Fahr., the unit volume weight; determination of elasticity and resistance to torsion, compression, transverse, and flexion. The quantity of material and the kind of preparation necessary for the trial pieces are prescribed in special regulations. Each shipment of wood is to be as far as possible accompanied by a description of the exact denomination of the kind of wood, age and time of felling; origin and condition of land on which grown; position of the south slopes, elevation above the sea, if from the interior of the forest or outside borders, &c.; geological condition of the growing land, &c. The results of the tests made are recorded, and a copy of the record in the form of a certificate given, stating the results of the test, without mentioning the purpose the material in question is to be used for. Results of tests will be published in the general Reports of the station, if the interested party does not object thereto. The superintendent of the station is also from time to time to publish special reports on the results of special interest.

NOTICE OF REMOVAL.—The Plastic Marble Co. has removed from 8, Berners-street to 13, Walbrook, E.C.

YARROW CONVALESCENT HOME.—Messrs. W. G. Cannon & Sons ask us to state that they carried out the gas-fittings, electric bells, and speaking-tubes in the above-named buildings, illustrated in our paper last week.

THE BATH STONE FIRMS.—Mr. James Saunders Randell, of Bath, has been elected a director of the Bath Stone Firms, in the place of the late Mr. James Stone. Mr. Randell was the senior partner of Randell & Saunders, the well-known stone firm, of Corsham, and has a practical knowledge of the trade, and a wide experience, which will probably be of much service to the company.

NEWCASTLE ANTIQUARIES SOCIETY.—At the last monthly meeting of the Newcastle Society of Antiquaries, held in the Castle, Newcastle, Dr. Hodgkin gave the interim report of the Northumberland Excavation Committee, which showed that the operations of this season at Æsica had been very successful, though the resource of the fund had been slender. The Committee, acting on the advice of Mr. Mackay, decided to entrust the superintendence of the excavations to Mr. Thos. Smith, of Sunnyside, who lived

within a mile of Great Chesters, and who was over the ground with Dr. Bruce. In the weeks during which the excavation had been in progress, the guard chamber to the east of the gateway, the whole line of the western wall, junction with the wall at the north-west corner camp, had been laid bare. The most interesting feature in the camp as yet disclosed was the main western gateway, which had been in Roman times so effectively walled up that both Dr. Bruce and Captain MacLauchlan even doubted its existence was now clear, however, that there was a gateway with that massive masonry which they had to associate with the works of the Antonine perors. This gateway had been destroyed, done at the time of some incursion of the barbarians. Later on, possibly about the time of Severus, a wall had been erected some eight or ten feet above the original one. The primary and secondary stone camp were here marked with unusual distinctness by the pivot holes of the gates which had been found at the two different lines mentioned. There had been apparently another destruction of the camp and another rebuilding with small stones and very inferior workmanship, and at the occupation of the camp the Roman troops, by time probably dwindled to a mere handful, despaired of being able to defend this gateway, and had, therefore, entirely walled it up, great many small objects were found, such as buckles, iron, and coins dating to the Constantinian.

ART-NOTES FROM FRANCE.—M. Paul Rappaport de MM. Cavalier, Barras, and Coutan obtained the Prix de Rome in sculpture, and Patouillard, a pupil of M. Gninain, has obtained in architecture. The Chamber called "Illustres" at the Palace of the Capitol at Toulouse, is decorated with panel paintings by Paul Pujol, one of the panels representing the life of the painter LaFage, who lived at Toulouse, another a symbolical subject representing "Muse Populaire enseignant la Musique aux Lousians."—A new Lycée for girls is to be in the Rue Sévigné, next door to the Hôtel Colbert, and another the "Lycée Victor Hugo," at Montca, (Lien) the theme of the Lycée, probably about the date of Nero have been discovered. Some courses of large stones have been found, the shaft of a fluted column of the Cornu order, a carved capital, and a statue.—It is reported that the Duc d'Angoulême intends to purchase the "Château d'Amboise."—An art exhibition in Rouen is announced to be in preparation for 1896.—M. Casimir Echevalier, Honorary President of the Architectural Union of Lyons, has just at that place, at the age of seventy-seven. He was born at Albi, and studied at the Ecole des Beaux-Arts at Lyons, where he afterwards practised the whole of his life. He was created a Knight of the Légion d'Honneur in 1870, and since Chevalier of the Légion d'Honneur received, in 1885, the gold medal for "Architecte Privée," given by the Société Centrale. He was one of the founders of the "Caisse de Secours Mutuelle." Besides his numerous buildings, he was known by a number of essays and published in the Transactions of the Société Académique of Lyons. He was the author of a valuable and learned work, under the title of "marques Historiques sur l'Architecture Lyonnaise aux 4 derniers Siècles." The death is also announced of M. René Ménard, architect, of Nancy, a member of the Société Centrale.

YORKSHIRE ARCHAEOLOGICAL SOCIETY EXCURSION.—The twenty-ninth annual excursion of the society took place on the 1st inst., and was journeyed by train to Pickering and drove waggons and char-a-bancs, to Lastingham where a tour of the church and its surroundings was made. Mr. St. John Hope acting as guide. Mr. Hope began his description by stating the syllable written in the programme respecting the history of the church was entirely wrong. From plans which had been drawn by Bilson, of Hull, and which, he said, the first plans drawn which professed to be accurate, he pointed out some interesting details. Lastingham was one of the earliest centres in the establishment of Christianity in the North of England. The church itself, he thought, would ascertain the real story. Bede gave a full and elaborate account which suggested that it had been built in the seventh century. The structure mentioned in that account had nothing to do with the present structure, as it occupied a site eastward of the present churchyard, and the only evidence of its existence was the stones which had been discovered. The foundation of the church was traced to the advent, in 1075, of monk Whitby, who came with the intention of establishing here a monastery, and there could be no question that they began this present building, the system they usually adopted in building monasteries. There was testimony to show that the monks stayed ten years, afterwards going to York and the parishioners took possession of the building in its unfinished form, and converted it into a parish church. There was evidence that the tower was carried to a certain height and then stopped, and the fifteenth century further building was done, and the rest of the work was of our own time. In the documentary history, he said, was absolute and

the close resemblance which the building at Corinthian chapel, he stated that the architecture was imported from abroad. At the church was built the builders must have been accustomed to Saxon work—men who had their education long before the Conquest. Says of Edward the Confessor. So it was hard to see so many survivals of the Corinthian. The company then inspected the crypt, which contains several interesting fragments of the twelfth-century Medievære stone. The survey was *via* Appleton-le-Moors and Sinderby, reaching by three o'clock. For one hour remained for the visit to the church. Mr. Hope conducted the party through the ruins, pointing out the architectural details associated with the towers, the curtain-wall, and, &c. A move was then made to the site where Mr. Hope brought the first stone. The site was a low, grassy slope, south porch, transept, and well-developed chancel, the date of the original Norman church is fixed by dealings with the effigies, supposed to be of Bruce. Mr. Hope gave his opinion that the effigies were unquestionably of the Roelkeff family; they were unique in one feature—viz., that the effigy in which they were clad was "double-armed, and was, so far as he knew, the only effigy in which the effigy had a single-link pattern. Mr. Hope afterwards gave a brief account of the work which concluded the programme.

LEGAL.

LONDON BUILDING ACT, 1894:

SECTION 59 AND 73.

mbeth Police-court, on the 16th ult., before
Mr. T. Sloman, of Albany-road, Cam-
was summoned by Mr. Bernard Dicksee,
Surveyor for East Newington, for non-
compliance with a notice for irregularity requiring
to carry up the party-walls 15 in. above the
required by Sec. 59 (1), and to corbel out
the party-walls 4 in. beyond the eaves or cornices as
by Sec. 72 (1).

Seager Berry, instructed by the County appointed for the District Surveyor, and A. Kingsbury for the defendant. McKiesse gave evidence to the effect that, on or about the 1st of May, 1901, he, on or last, notice was given him by the defendant, the erection of five new dwelling-houses on 134 (even), Bagshot-street, Newington, and on the premises of the defendant, irregularly situated, and bounded by the defendant's premises, and on May 10 he served upon the defendant a statutory notice (copy of which was produced) to the effect that the defendant was to remedy the same. Some of these irregularities were not amended, and consequently the defendant was served with a summons on May 15 was issued. Since the commencement of proceedings the defendant had amended certain of the irregularities in the back eaves mentioned in the statutory notice, but the premises were required to be brought into conformity with the Act, and otherwise nothing had been done. A diagram showing how the work had been executed, and how the Act required it to be executed, was put in and explained by the defendant's witnesses. The party-walls had been raised up by 13 to 13½ inches above the upper surface of the slates, instead of 12 inches as required by the Act. It was complained in the evidence that a wooden fascia or gutter-board which was nailed to the rafters feet, projected beyond the surface of the brickwork; the iron gutter was screwed to the fascia, and a fillet of wood was nailed to the underside of the fascia to support the underside of the roof. This fascia was prohibited by Sec. 73 (1), and the party-walls were consequently irregularly situated. The defendant had roofed in and practically finished the buildings since the irregularity had been pointed out to him.

examined, witness said that he had measured the parapets from the upper surface of the roof at the point where the parapet became less than 1 in. in thickness, the minimum thickness by Sec. 50, (1), the height above the roof surface being 12 in. The parapets were made of three thicknesses of slates $\frac{3}{4}$ in., together $1\frac{1}{2}$ in. Asked whether he was to treat the fascias part of the roof if it were fully covered with metal he acquiesced, protesting the rule applied. He was asked whether the roof was covered with metal from the operation of the law as a projection. Defendant then agreed the eaves in this manner.

Burgess argued that the District Surveyor measured the parapet in the wrong manner. He said that the roof was covered with slate. He cited Sec. 61 in support of this. In this section the roof was required to be covered with slate, tile, metal, or other incombustible material, therefore the roof existed before the law was passed. He said that the roof was not the covering of the roof. That it had always been followed in the past.

man said one object of a new Act was to
ld practices.

rry pointed out that by Schedule 1, Pre-
Rule 1. every building was required to be
by walls, and said nobody could contend
walls were not part of the building ;
the roof was to be covered with slates or
rial, but the roof was not complete without

the covering: he contended the District Surveyor's method of measuring was correct.

Mr. Denman said the expression "above this roof" in the section must be taken to mean above the roof as a whole, and not above any particular part of the roof. The defendant was not entitled to dig down into the roof to find a point from which to measure. The measurement must, therefore, be taken above the surface of the slates, but the deficiency was small, and he, therefore, thought some arrangement might be made with the District Surveyor.

Mr. Berry pointed out that the District Surveyor had no discretion in the matter; the section laid down a minimum, and that minimum had not been complied with.

Mr. Denman finally decided to adjourn the case for fourteen days in order that the defendant might alter the eaves as arranged, during which time he would further consider the question of the party-walls.

At the adjourned hearing on the 30th ult., Mr. Berry said that the defendant had covered the wooden fascias with zinc, but that was not sufficient to satisfy the District Surveyor, as they should also have been set back flush with the face of the brickwork, whereas they still projected, and consequently were contrary to the section.

Mr. Kingsbury objected that the defendant had done all that he undertook to do. He only agreed to cover the fascias with incombustible material.

Mr. Denman said that he understood that the defendant had made an offer to do certain work which the District Surveyor had accepted, and he (Mr. Denman) had not taken particular notice of what had been agreed upon; but if the District Surveyor was not satisfied, and the matter had to be argued out afresh, a new summons had better be taken out, as the work was now different from what it was at the first hearing.

Mr. Berry argued that the case really stood where it was, as the notice of irregularity had not been complied with. With regard to the party-walls there was another point, which was not gone into at the first hearing; there were in the rear of the houses four water-closets in pairs; in these the party-walls were not carried up above the roofs at all; there were absolutely no party parapets; the statutory notice and summons would cover this irregularity.

Mr. Kingsbury objected that this matter was not mentioned at the previous hearing, and therefore ought not to be gone into; besides which the roofs of the water-closets contained no woodwork whatever, and therefore no party-wall was necessary.

Mr. Berry dissented.
Mr. Denman thought that as these particular party-walls were not mentioned at the first hearing they should be made the subject of a fresh summons or the case further adjourned.

Ultimately Mr. Berry said that, having regard to a remark that the magistrate had made at the first hearing as to the small amount of deficiency in the height of the party-walls of the main buildings, he would be willing, if the magistrate would give further guidance a definite ruling of the subject, to withdraw the present summons without prejudice to the question of the fascias and the party-walls to the water-closet buildings.

Mr. Kingsbury said that he had several witnesses to prove that the custom for the last thirty years had been to measure from the rafters.

Mr. Denman said that he had considered the matter, and he was prepared to hold that the measurement must be taken from the upper surface of the roof as contended by the District Surveyor.

The summons was then allowed to be withdrawn, defendant to pay 17. 1s. costs to the District Surveyor, it being understood that, if necessary, a fresh summons would be taken out for the irregularities shown in the fascias and the party-walls to the water-closets.

BUILDING DISPUTE AT SOUTHEND:

ACTION IN THE CHANCERY DIVISION.

THE CASE of the Mayor of Southend-on-Sea, Ramus, came before Mr. Justice Romer in the Chancery Division last week, it being an action brought by the Corporation of Southend-on-Sea, which is the Urban Sanitary Authority for the borough, against Mr. Ramus, to obtain an injunction restraining the defendant from continuing to occupy a certain time at Southend to be occupied until they had been completed according to deposited plans, and in conformity with the by-laws of the borough. It appeared that the defendant from time to time deposited plans of an arcade of shops to the east of the town, which were disapproved, and that he then made alterations in the plans so as to provide for the air space at the rear required by the by-laws. The contention of the Corporation was that some of the shops had been let and occupied in such a manner as not to comply with the by-laws, inasmuch as they were completely cut off from all communication with the main street, and that the shops so occupied as lock-up shops without any air space at the rear, though, if occupied with the rear premises (in one occupation), the requirements as to rear space would have been complied with. The plaintiffs also complained that if the other shops were let in the same manner, the requirements as to rear air-space cut off the defendant would be able to evade the by-laws.

After hearing evidence and the arguments of counsel, his Lordship, in giving judgment, said that the injunction was only asked for so far as related to the parts of the building which were at present unoccupied, for the lessees of the occupied parts were not before the Court, and he could make no order in respect of them. He said that the defendant's action was brought the building had not been completed in accordance with the deposited plans; but it was admitted, on behalf of the plaintiffs in the course of the trial, that immediately before the trial the building had been so completed, and, therefore, no injunction could now be granted with respect to the unoccupied parts. He only granted an injunction with respect to the occupied parts, on the ground that the plaintiffs (his Lordship) considered it proper to grant it for him (his Lordship) to consider on what other grounds the injunction could be asked for. Two, and two only, had in substance been urged on behalf of the plaintiffs—the one was, that the defendant was threatening and intending, with regard to the unoccupied parts, to allow them to be occupied so as to render the building complete, and the other was, that it was difficult to ascertain exactly how the plaintiffs put their case under that head, beyond that they said that defendant was going to let each room at present unoccupied as a separate shop, and that, though the building, treated as a whole, had, in the rear, a sufficient area or open space as provided by By-law No. 54, for each room, if treated as a separate shop (which is a question for the jury to decide), the defendant was by-law according to the definition) would have a sufficient area or open space. There was no general by-law which prevented a building with several rooms erected in accordance with deposited plans from being let or occupied in parts—each room by itself. The only by-law the plaintiffs relied on on that part of the case was the additional By-law No. 18; but that was not in force at the time the defendant said that the same as altered would if at first so constructed, have contravened some other by-law. So far as concerned the unoccupied parts of the building then before the Court, the defendant had not altered them at all from the deposited plans; nor could he hold on the evidence that the defendant was going to alter them so as to infringe Rule 18, or any other by-law. He could not give an injunction, because the defendant had let on lease the occupied parts as separate shops, restraining the defendant from allowing the unoccupied parts, as they stood, to be occupied at all. The remaining ground relied on by the plaintiffs was based on By-law 57, it being said that that by-law, by implication, prohibited the defendant from allowing the building to be occupied before the expiration of the seven days therein mentioned, and (as the facts were) that the parts of that building already let were so occupied. He could not see how on that ground he could grant an injunction restraining the defendant from permitting the parts of the building then remaining unoccupied from being occupied at all. Having said so much, his Lordship said that he should dismiss the action, but without costs.

Mr. Wm. Willis, Q.C., and Mr. C. H. Smith were counsel for the plaintiffs; and Mr. Hopkinson, Q.C., and Mr. Dunham for the defendant.

NEGLECT TO GIVE NOTICE.

MESSRS. T. WHITE & SON, of 52, Fairfield-road, Bow, E., were summoned at the North London Police Court on the 1st inst. by Mr. A. Payne, District Surveyor of East Hackney, South, and North Bow, for commencing works in the rear of 114, Cadogan-terrace, without the notice required by Section 145 of the London Building Act. The defendant admitted the offence, but said it took place owing to a misunderstanding with his employer, the occupier of the house.

The magistrate said that the notice ought to be given, and imposed a fine of 2s. 6d. a day from the time when the notice should have been given, and allowed 12s. 6d. costs.

INFRINGEMENT OF THE BIRMINGHAM
BUILDING BY-LAWS.

At the Big Chingham Police-court, on the 2nd inst., John Pitt, of Chetwynd-road, was charged that he did unlawfully, in erecting a new building in a proposed new street leading out of Dudley-road, not to cause the walls enclosing such building to be properly bonded and solidly put together with good mortar, and in contravention of the 4th and 5th sections of the Public Health Act, 1875, and in contravention of the by-laws. The Town Clerk (Mr. Horatio Brevitt) prosecuted, and Mr. R. C. E. Plumtre defended. The defendant had erected a row of ten houses, and entered into a contract with Eli Bird, a bricklayer, for the latter to do the labour for 1868, while the defendant was to provide the materials. On the 20th inst., the defendant, as building inspector for the Corporation, visited the building, and took away a sample of the mortar in use. This was submitted to the Borough Analysts (Mr. E. W. T. Jones), who gave a certificate that the material was unsuited to the name of mortar, and was simply mud. This would only hold the defendant liable, if the mortar was not given off an unwholesome odour.—Defendant was fined £4, and 4s. costs.

MEETINGS.

MONDAY, AUGUST 12, to SATURDAY, AUGUST 17.
Architectural Association. — Annual Excursion to
Cheltenham and neighbourhood.

The Builder.

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ILLUSTRATIONS.

The Lecture Hall, Imperial Institute.—Mr. Thomas E. Colcutt, F.R.I.B.A., Architect *Double-Page Photo-Litho.*
First Premiered Design for Durham County Council Buildings.—Messrs. Cooksey & Cox, Architects *Four Single-Page Photo-Litho's.*
Architectural Association Excursion, 1895: Sketches on the Line of Route.—Drawn by Mr. R. W. Paul *Double-Page Photo-Litho.*

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The late Richard Morris Hunt.



ALL our readers will hear with regret of the sudden death of Mr. R. M. Hunt, the eminent American architect, which took place, on July 31, at his summer residence at Newport, in Massachusetts. By this sad event a unique figure is removed from the ranks of American architects, and a career has been closed which is not likely to be paralleled in American architecture.

In his later years no architect in America was so universally looked up to as the head of his profession; his very many executed buildings, in all parts of the country, brought him wide fame outside the profession, but it was within it that he was especially revered, and no architect of his day enjoyed a broader popularity and respect among his fellow workers.

The extraordinary position Mr. Hunt held in American architecture can only be understood by realising the conditions under which he practised his art. His name heads the long list of American students who have studied at the École des Beaux-Arts in Paris, and he was thus the first to set that fashion of study which he lived to see dominate American architecture in a way no other style or system has dominated it. Mr. Hunt not only studied at the École, but he enjoyed the exceptional privilege of working on the drawings for the Pavillon de la Bibliothèque of the Louvre. The significance of these achievements was scarcely understood in the United States, when he returned there in 1855 at the age of twenty-seven, all but ready to assume the practice of architecture. Neither the advantages of French study, nor wherein consisted the honour of such intimate connexion with the greatest building of the French capital, were understood or appreciated in America at that time. But Mr. Hunt lived to see both his professional brethren, and the general public, so far as the latter affected an interest in architecture at all, awake to the meaning of these advantages, and his Parisian record now stands as the model that many an American draughtsman would imitate if he could.

The extraordinary interest in the French system of architectural training that followed hard after Mr. Hunt's return from Paris

gave his achievements there a peculiar value in the eyes of the younger men growing up around him. They formed the foundation of the remarkable career of regard and admiration this architect enjoyed among his fellows. Fortunately Mr. Hunt lived up to his training in the truest sense. His social connexions were large and powerful, and many important commissions were confided to him. He had thus the amplest opportunities of giving actual expression to his training, and illustrating in his buildings the principles and methods of the great school where he had begun his architectural studies.

Before his practice had assumed large proportions, however, Mr. Hunt laid the second great stone in the foundation of his professional career, by opening an atelier for architectural study in New York, modelled on the system in vogue in Paris. In this lay the real strength of the regard of his fellow-workers. Many of the men who later on carried out much of the more important work in the United States were students in the Hunt atelier. Mr. Hunt thus acquired an extraordinary influence over the young men who, in a few years, became his competitors. Thus it happened that his professional relation with many of his contemporary architects was quite unlike that enjoyed by others. It was devoid of that professional rivalry and jealousy that so quickly destroys friendships and friendly associations, but was always that of an elder brother, kindly disposed towards the younger men, always ready with a word of encouragement. No other American architect obtained such a position, nor is it likely that the conditions will again arise that will permit a similar career.

Yet Mr. Hunt founded no school, he invented no style, he had no followers in a personal sense. His work was careful, accurate, scholarly, refined; often it was beautiful, and frequently it satisfied every requirement of pure architecture. In later years it approached, at times, perhaps too closely to the unfeeling and hard work of the ultra-French school. Yet at the very time these designs were issuing from his office he put forth other designs, which were replete with the keenest artistic feeling, and which, in many cases, will rank with the finest of his undertakings, and, indeed, among the finest products of American architecture.

The closeness with which Mr. Hunt adhered to the traditions of his training doubtless had much to do with the extraordinary reputation he enjoyed among the

American architects of his day. Those who, like him, had studied in Paris, were quick to recognise the inherent merit of his work, which so freely confessed its origin, and yet which, in his hands, was admirably moulded to satisfy American conditions. There was a feeling abroad that with Hunt the traditions and the work of the School of Fine Arts were in perfectly safe hands. Thus he appealed to those trained as he had been by his conservatism, while the refined quality of his art brought him many friends and admirers otherwise not in sympathy with the style he cultivated.

In the course of his long professional career—he was sixty-seven when he died, a career which is called long in America—Mr. Hunt designed many important buildings. As is the case with every American architect, his work included a host of miscellaneous structures. In commercial architecture his best-known work is the Tribune Building in New York, the pioneer of large office buildings in America, now become dwarfed and insignificant beside the gigantic structures that have grown up around it. His Lenox Library in New York, and the Fogg Art Museum of Harvard University at Cambridge in Massachusetts, may be grouped together as his most notable monumental structures. His Administration Building at the World's Columbian Exhibition at Chicago* was more pretentious than either of these, though but a temporary structure. His greatest successes, however, were unquestionably his dwelling-houses, of which he built a large number for very rich men, and thus enjoyed peculiar advantages in having large means and ample spaces at his disposal for the securing of architectural effect. Many of his houses in New York and at Newport are among the finest examples of domestic work yet done in the United States, and they will long remain as enduring monuments of his artistic abilities and keen æsthetic perception.

Mr. Hunt was almost the only American architect who was well known abroad. His early French associations were actively maintained down to the end of his life. His foreign honours were numerous, and of the highest rank, and his fellow-architects felt, and perhaps not unjustly, that in the awards made to him the whole American profession was being honoured. The award of the Royal Gold Medal by the Royal Institute of British Architects in 1893 crowned a career

* See our issue for August 8, 1891, for an illustration of this building.

of great usefulness, and was a fitting distinction conferred upon a man who stood without a peer in the affections of his brothers, and unrivalled in the estimation of the American public.

The period during which Mr. Hunt was the leading figure may be said to mark the second chapter in modern American architecture, the first chapter being that in which Richardson was the principal figure. Before the Richardson period American architecture had hardly developed as a living art; not that we mean, of course, to attribute its awakening to its new career wholly to Richardson, but he was the most prominent figure of the period, and certainly exercised an influence over the style of his contemporaries which was very remarkable; and perhaps there is no instance in modern architecture of a single man doing so much towards making a style of his own, and inducing others to accept it. But things move very fast in the United States, and already the Richardson style may be said to be dying or dead. It was an exceedingly picturesque style, though somewhat wanting in refinement, and it had an air of greater originality than perhaps was really to be credited to it, owing to its being founded (so far as it was founded on anything old) on a far-off ancient style, for it was certainly dependent upon Byzantine suggestions. The nearest parallel in this country to Richardson and his influence on his contemporaries is perhaps to be found in the history of Mr. Waterhouse's evolution of his own phase of modern Gothic, and the large following it met with. But this was a modification of a revival already commenced, and therefore had not the same appearance of originality as the Richardson style. That the latter could be pretty easily copied was evidently found out before very long, and this very fact has probably led to its running out of favour, to a great extent at least, almost as fast as it came in.

Richardson's work, however, was a distinct attempt to evolve a modern American style; Mr. Hunt's influence has lain in the other direction. He has aimed at introducing French modes of thought and design into American architecture, and with so much success that one sometimes feels that the object of American architects at the present moment is to be more French even than the French themselves. As far as regards the systematising of architectural study this influence has no doubt been for good. And in regard to its influence on American architectural design generally it may be said perhaps to be a safer path than that of Richardson. Nevertheless, those who look with interest to America as the possible field for the development of something new in architecture would naturally regard these ultra-French leanings, which took their rise mainly from Mr. Hunt's influence, as a somewhat doubtful blessing. With all admiration for the excellent work which Mr. Hunt did, both in regard to the production of refined buildings and the promotion of systematic study, they would rather see America with her own architectural ateliers and schools of architecture on her own lines, than see her occupied in transplanting the methods and tastes of the Ecole des Beaux-Arts to her own shores.

ON COMMON COLOURS.

By A. P. LAURIE, M.A., B.Sc., F.C.S., F.R.S.E.



HILE so much attention has been devoted to the durability of the finer and more expensive pigments which are used by artists, very little has been done in the direction of inquiring into the common pigments which are used for decorative work and for ordinary house-painting, and yet it may often happen that work of real value has been done of a decorative character, or some important scheme of colour worked out under the direction of an architect, which is of per-

manent value, though, unfortunately, is not of permanent material; nor, to take the humbler department of house-painting, is it altogether to the credit or advantage of an architect that colours which have been put on walls under his direction, should fade in the course of a few months. Then there is the whole question of wall-papers and the selection of wall-paper which is not only beautiful in design, but is also sufficiently durable in colour. No doubt the highest degree of permanency is not required in this case, as a wall-paper gets dirty and has to be renewed; but there are limits even here to the fugitive character of the pigments that should be employed. For instance, I once heard a paper-hanger complain that the room that he was papering had no shutters, and that the blinds had not yet been put up. I asked him the reason why, and he explained to me that the house was being prepared for a young couple who had just gone off for their honeymoon, and would not be back for a fortnight, and by that time the colours would be all gone.

The fact of the matter is that the complexity of the problem has been enormously increased of late years by the introduction of pigments, which consist of some solid, heavy powder, such as chalk or barytes, dyed with aniline dyes. The aniline pigments are remarkable for beauty and brilliancy, but cannot be trusted in most cases, though some are sufficiently permanent for wall-papers. Unfortunately for those ignorant of chemistry, much ingenuity has been devoted by the makers of these pigments to the imitation of well-known colours, and with so much success that the colours themselves have been surpassed. I have no hesitation in saying that if an artist were shown a sample of real cobalt blue and a sample of imitation cobalt blue, made from an aniline dye, he would select the imitation as being the finest colour, though he would very soon bitterly regret his choice when he found that a dirty stain was left wherever the blue had been used.

These colours made from aniline are being largely used at the present time for paper-staining, and it is of great importance that they should be carefully classified according to durability, so that paperstainers and others should know what to expect when using them. It must not be supposed that the discovery of coal-tar products has led to nothing but more fugitive pigments. The preparation of alizarine artificially has been of the greatest benefit, giving to artists and decorators strong, rich lakes which are absolutely permanent and of great beauty. But to return to the architect who is anxious to perform successfully some piece of decorative work, he is at present entirely at the mercy of his painter, who is himself probably ignorant of the composition and properties of many of the colours that he uses, and the light of science not having been directed upon his work, is the victim of many prejudices.

When a meeting was held, about two years ago, with a view to establishing technical teaching for house-painters and decorators, I wrote, at some length, to the President of the Conference, urging the importance of having instruction for painters on the nature and properties of pigments, and of the simple chemistry of their manufacture, but of so little importance is this considered by the trade, that my letter was not even acknowledged by the President of the Conference, and as far as I am aware, nothing has yet been done in this direction.

In order to illustrate the difficulties of this subject, and the opening there is for careful inquiry into the properties of the pigments sold for ordinary decorative work, I will take as an example the price-list of a well-known firm of colour-makers. On adding up the various names of pigments in their list I found it amounted to 147 different pigments, and on referring to the latest work on colours which has been published, and which is recognised as a satisfactory book on the subject, I could only trace 75 of these pigments, the other 72 being either pigments of

different composition to those commonly known, or being old friends under a new name. Take the 75 known pigments, 25 of these were pigments well-known to be fugitive, so that we had left out of 147 pigments only 50 which were of known composition and durable. It is, of course, quite possible that many of the unknown 7 pigments were also permanent, but this does not affect my argument, that anybody working from this catalogue would be quite in the dark as to the properties of the substances he was using.

There would, of course, be very little difficulty in an analytical chemist identifying these unknown pigments and advising as to their durability, but the analytical chemist does not seem to be used for this purpose at present. Then, besides this, there is the importance of selecting pure oils and varnishes, and considering, as well, the conditions to which the painting is to be exposed. For instance, nobody would dream, who knew his work, of using for decorative work inside London the same pigments, oils, or varnishes that might be safely used in a building out in the country. There is a further matter to which sufficient attention is not paid. Pigments may be required to be laid on in a medium of oil, or to be laid on as distemper colours; or in other cases they are used merely mixed with lime for fresco, in which case a special palette must be selected, the pigments which will stand under one condition being fugitive under another, and there can be no doubt that a great deal of wall decoration which has perished in modern times has done so simply because unsuitable pigments have been used. It is a common remark when looking at the work of past ages in colour to say that the old masters must have had permanent pigments, while nowadays decorators and artists are the victims of fugitive paints, and that if they only had the paints of the old masters they would be all right. Now this view is completely false. The painter of to-day has a larger number of permanent pigments at his disposal than the painters of the fifteenth century, and the reason why his work does not stand as well is not so much the fault of the chemist or the colourmaker as it is his own fault; he does not know his own business, and consequently he makes mistakes. For instance, Cennino Cennini, who writes early in the fifteenth century, mentions only five pigments, including black and white, which he considers can be safely used for fresco-painting; but this limited list could now be considerably added to, so that the fresco-painter of to-day has a larger palette of permanent pigments to work with, and he spoils his work simply because he will not keep within the proper limits.

I have already said that the conditions to which the pigments are to be exposed should be carefully considered in each case. It must be remembered that in the case of our large towns atmospheric conditions exist which were unknown in the past. The presence of sulphur compounds in the air is one of the most serious of these, and necessitates a careful avoidance of lead, except in the one form of lead sulphate, in internal decorative work, and yet although the house-painter and decorator can perfectly well avoid the use of these lead compounds, he will not do so. The boiled oil he uses contains lead, but he can obtain boiled oil free from lead; the varnish he uses contains lead, but he can, if he likes, obtain varnish free from lead; the driers he uses are in many cases lead compounds, but he can obtain driers which are just as good and contain no lead; and last of all, he will use an ordinary white lead which is bound to turn a dirty yellowish-brown very quickly, although he can obtain patent white leads at the same price and of equal covering power, which resist the action of sulphur compounds in the air. All this is simply the outcome of ignorance, and is due to the fact that while chemists have been steadily improving pigments, oils, and var-

nishes, and have been solving these problems, the result of their labours is ignored by the trade. One would have imagined, for instance, that the fact that these patent white leads are practically non-poisonous would have caused them to have been at once adopted by a trade in which so many fall victims to lead poisoning; but it is not so, and it seems impossible to interest them in the question. Surely architects should look into this matter for themselves, and should insist upon the application of modern scientific knowledge to painting and decorative work. Every industry which has had the light of science turned upon it has enormously developed and improved, and, for example, the art of dyeing has been revolutionised by the work of the scientific chemist; but the other decorative arts remain obdurate, and the work perishes, not for want of knowledge, for the knowledge is waiting to be applied, but because those engaged in decorative work will not call upon the man of science to advise them or assist them in their labours.

A. P. L.

NOTES.

THE interpretation of the nine central metopes of the south side of the Parthenon has been usually given up as a hopeless task. These metopes interrupt suddenly the series depicting the battle of the Lapithæ and Centaurs, and it is just here, where interpretation is most difficult, that the originals have perished (*i.e.*, in the explosion of 1687). We have the drawings of Laborde, notoriously untrustworthy in details, and that is all. A careful study of these drawings has, however, led Dr. Pernice to the conclusion that the main subject, or rather subjects, can be clearly made out and this interpretation, given in full in the new number of the "Jahrbuch" of the German Archaeological Institute (x., 2) deserves the careful attention of all archaeologists. His theory is briefly this: the nine metopes relate the religious history of primitive Athens in three scenes—*i.e.*, the nurture of Erichthonios in the chest, his battle with Amphiptyon, and his institution of the worship of Athene. A glance at Laborde's drawings (reproduced in the "Jahrbuch") will show that his theory affords at least a simple and straightforward explanation of the scenes represented. The new interpretation would probably have suggested itself long ago but for an inveterate habit of regarding metopes as isolated independent compositions. That this was in archaic art by no means always the case is seen clearly in the newly-discovered metopes of the Athenian Treasury at Delphi, where no less than five metopes are devoted to the single scene of the combat of Herakles with Geryoneus. The question naturally arises, why should these nine metopes be introduced, breaking the series of Centaur compositions? Dr. Pernice conjectures that they may have been prepared for the earlier Parthenon, and he further thinks that possibly they may have been intended to indicate the arrangement of the inner cella, the scene of the dedication of the early *xoanon*, symbolising, as it were, the presence of the later Parthenon within. This is, of course, merely a conjecture, but an interesting one.

TWO monuments of considerable interest in relation to the worship of Demeter have recently come to light during the excavations carried on by Mr. A. Skias at Eleusis. One is a quadrangular terracotta *pinax* or drawing-tablet, surmounted by a pediment, the whole measuring 30 cm. by 15 cm. On it is painted a composition in two rows, one above the other. To the right of each row is a seated goddess, approached in the upper row by four, in the lower by three, figures all represented in lively action. The procession in the lower row is headed by a youth with long hair, high boots, and holding two torches; in the lower row the

leader is a woman heavily draped, wearing a diadem, and also holding two torches. The women figures in both processions wear curious objects, as yet unexplained, on their heads. A rough reproduction of these curious designs appears in the current number of the "Astru." It is hoped that some light may be thrown by them on the Eleusinian ceremonies. The style is of the fourth century B.C., and the *pinax* bears the inscription *Νῆμειον τοῖν θεοῖν ἀνέθηκεν*. The second Eleusinian monument is a beautiful red-figured vase, 22 cm. high, with a representation of Demeter, Kore, and Triptolemos. The inscription, *Δημητρία, Δήμητρι ἀνέθηκεν*, bears traces of having been gilt.

THE artistic treatment of placards is a subject to which a good deal of attention has recently been directed, especially in France, and to some extent in England, and it is interesting to note that Germany seems to be following suit in this respect, for we hear that in Berlin competitions have been opened for the designs of posters for the International Art Exhibition and the Berlin Industrial Exhibition, both of which will be opened next May. We have not seen the conditions under which these competitions are held or who the assessors are. We, however, understand that in both cases the premiums are comparatively substantial, *i.e.*, 50*l.*, 25*l.*, and a number of minor ones. The competition for the Industrial Exhibition has already been decided. There were no less than ninety-eight designs. At the same time we may notice the effort in Berlin to improve upon the stock pattern of lamp-posts, &c., for the streets. A competition has now been opened for a design for the standards necessary for the wires to the new electric trams. Three premiums of 50*l.* each were given, together with a number of smaller sums, and 132 designs were sent in. The results in both instances are satisfactory.

DR. R. DEANE SWEETING, in his report to the Local Government Board on an outbreak of enteric fever at New Delaval, in the Tynemouth Rural District of Northumberland, after commenting on the usual danger and nuisance of the privy midden in rural districts, draws attention to a new source of insanitary influences special to the district, and which we have not before seen mentioned. It seems that at New Delaval it is a habit of the colliers to throw on the ground around their dwellings the "duff" or screenings of the small coal that they are allowed by the colliery company. This "duff," mixed with midden and other refuse, including, sometimes, house slops, gives rise to a distinct nuisance, both directly by emanation from the foul matters apt to be contained in it, and indirectly by forming elevated ground from which moisture may gravitate into the foundations of the houses. This constitutes an especial danger to the houses of the rows built of absorbent stone, such as most of South-row and all Middle-row. The matter, we are glad to learn, has engaged the attention of the colliery authorities, who have been excavating this "made ground" between South-row and Middle-row, and levelling the ground generally between the rows. The incident is worth noting as showing what an all-round watchfulness is needed to avoid the creation of insanitary conditions in contiguity with dwelling-houses of the humbler class.

THE case of the Queen v. the Vestry of St. George, Hanover-square, which is reported in the current number of the "Law Reports," decides a curious point in regard to the drainage of London. It appears that three houses in Grosvenor-road drained by means of a single pipe directly into the Thames. The County Council, with a view to stop the pollution of the river, made an order on the Vestry to construct a new sewer of specified dimensions, and in accordance

with a specified plan, to carry the drainage of these houses into a low-level sewer belonging to the County Council. The question was then raised whether the Council had any jurisdiction to make this order, and the Court decided that it had not. Under the Metropolitan Management Act, 1855, Section 135, the Metropolitan Board of Works, and now the County Council, can make such sewers as may be necessary. "The intention of the Act," said the Court, was that if the Board thought a sewer was necessary, they should make it themselves, not that they should order the Vestry to make it for them." The one hundred and thirty-eighth section, under which the Council purported to act, was again intended merely to give that body a control over the construction and arrangement of new local sewers, and was not intended to empower the central body to order new sewerage to be constructed by the local authority. It is clearly undesirable that drainage should be allowed to contaminate the Thames, but the object would seem to be within the Rivers Pollution Act, 1876. At any rate, the means taken by the Council was the wrong one.

ANOTHER decision, to which the London County Council was also a party, was given shortly before the Courts rose for the Long Vacation. The question simply was whether a court-yard to a new set of flats, which yard was used for the exit and entrance of carriages, was a new street within the meaning of the London Building Act. In the opinion of the Magistrate who first heard the case, the yard was a street; in the opinion of the Divisional Court, it was not. The point is of some importance to those concerned with the erection of buildings in London, and this decision seems to set at rest any doubt which there may be on the subject.

THE destruction of electric fittings by a lightning discharge is a rare occurrence in this country. During the thunderstorm of last Saturday this happened at the Woodburne Hotel, Douglas, Isle of Man. In this hotel an arc-lamp was supported on a flagstaff fixed on a turret. The flagstaff was struck by lightning, and the discharge went through the electric fittings, being the path of least resistance to earth. The fittings were destroyed, the ceiling of the billiard-room was set on fire, and several persons experienced severe shocks, although the building, as a whole, received very little damage. This accident shows that it is advisable to have lightning arresters properly fixed whenever a building is distinctly higher than its surroundings, and has external lighting arrangements in the roof, whether they be gas or electricity. These protectors cost very little, and very rarely fail, the failures arising, as a rule, from faulty earth connexions, the ground wires being sometimes simply pushed into the earth. The points usually selected for a lightning discharge are trees, church steeples, tall chimneys, and the like—in fact, anything which is a conspicuous mark in the landscape. This is emphasised by the death, by lightning, of a labourer crossing the brow of a hill near Eastbourne during Saturday's storm, following, as it does, the recent death of a doctor in the north under similar circumstances. It is well known that lightning-conductors with faulty earth connexions are dangerous, but they are also sources of danger when they are placed near gas or water-piping or electric wires, as there is a tendency for the discharge to "side-flash" under these circumstances. In accidents from this cause which have occurred in America, porcelain switch-boxes have been broken in pieces and the screws burned; occasionally, too, the metal conductor is found broken into small pieces. As a general rule, however, it is next to impossible for a lightning discharge to enter a house by the electric mains unless it is invited to do so by an arc lamp-standard fixed on the roof.

THE Berlin annual Salon of 1895, though quite representative of German picture painting, scarcely claims attention outside Germany, owing to its unfortunate inferiority in comparison to the other art exhibitions of the Continent. With few exceptions the Berlin catalogue this year describes non-descript canvases of unsatisfactory composition and technique. There are more than two thousand paintings on the walls, and yet the only pictures that would call for the attention of an English connoisseur are by the few recognised artists such as Anton von Werner. Compared with former exhibitions, the Salon perhaps shows a greater tendency on the part of the German artist to be over-patriotic in his subjects, and we are afraid this doubtful movement is mainly due to the encouragement of the Emperor, who has always been a ready purchaser of patriotic subjects, no matter what the merits of the painting as a work of art; and his patronage generally means popularity for the author. Sculptors are better represented at Berlin than last year, and the halls devoted to their 250 pieces of statuary are certainly more interesting than the endless galleries of mediocre canvases. The same extravagant patriotism is, however, unfortunately again to be found in many of the monuments to the late Emperor and other memorials. As to the architectural exhibits at Berlin, they are simply a farce. Some excellent drawings of the new station at Cologne, designed by Professor E. Jacobsthal, are the only things of any importance in the Architectural Room.

THE London County Council have just opened to the public a new garden in Clerkenwell parish. The ground, being in two parcels, and about three-quarters of an acre in extent, is part of some land they took for making Rosebery-avenue, which here traverses what was Spa, or Pipe, Fields, south side. It lies along the eastern side of that thoroughfare, adjoining the old Spa Green, which is now included in the new recreation area. The Council voted 1,500*l.* for laying out the ground, which has been done under direction of Colonel Sexby, chief officer of their Parks Sub-Department; two years ago they voted 10,000*l.* for purchase of the plots, the money being provided from the amount assigned for buying an open space under the Post Office Sites Act, 1889 (Cold-bath-fields Prison). The environment of Spa Green has been greatly changed by the extension of Rosebery-avenue across Rosoman-street and Garnault-place, and so south of New River Head through what was Myddelton-place to join St. John Street-road, formerly Islington-road. Thus have disappeared the "Sir Hugh Myddelton" tavern (1831) with Deacon's Music-hall, Eliza-place (along the south side of the footway from the New River Company's offices to Myddelton-place), and the upper ends of Rydon-crescent, Thomas-street, and Lloyd's-row.* A large tree opposite the south end of Green-terrace, built in 1827 and named after John Green, clerk to the New River Company, who married Sir Hugh Myddelton's granddaughter, Elizabeth, and died 1675, marks the original limit of the green, but that end of it was taken for roadway and for extending Gloucester-street to meet the new avenue. In Lloyd's-row, north side, at the corner of Spa-cottages, stands an old house, older than its neighbours, bearing in large letters "Islington Spa or New Tunbridge Wells." This spa, like its contemporary, Sadler's Wells, formed a highly popular resort during the last twenty years of the seventeenth century, reaching the summit of its fame circa 1733, when George II.'s daughters often went thither to drink the waters, their progress through Spa-fields, an open space until eighty years ago, being greeted with

the discharge of cannon. The spa is in Clerkenwell; Lady Mary Wortley Montague, it is said, first directed attention to the properties of its spring, a light chalybeate, which still flowed within our memory. The extensive gardens were originally entered from No. 6, Eliza-place; in 1810 that entrance was replaced by one in Lloyd's-row, next to the old house mentioned above, and close to the spring.* Owing to their once open situation the precise limits of the gardens is not readily to be traced. Having compared some old maps with the Ordnance Survey, 1871, 5 ft. to a mile, we believe we correctly say that they were bounded by Eliza-place, Lloyd's-row, St. John Street-road, and the western arm of Thomas-street; at the north-western corner stood the "Sir Hugh Myddelton," successor to the "Myddelton's Head," built in 1614, and depicted in Hogarth's "Evening"; the middle one of the three plots lately planted by the Council is, in fact, on the site of the western portion of the old gardens, which were considerably reduced in area by the building of the present Spa-cottages, a *cul-de-sac* behind Lloyd's-row, in their midst in 1840. It is, perhaps, worth while to point out that as many writers treat Sadler's Wells and Islington Spa as one and the same, the identity of the latter, clearly a separate place, has been commonly overlooked. A view by Geo. Bickham, jun., is in the "Musical Entertainer," 1737.

THE annual business meeting of the delegates of the various German architectural and civil engineering societies will be held at Schwerin on the 31st inst. The agenda-paper includes a number of interesting subjects for discussion, besides the usual business transactions; and among the latter is a proposal for the revision of architects' scale of charges, as well as a curious suggestion that architects should agree on some policy to prevent their works from being appropriated by literary publications. There will also be a discussion on the position of municipal building officials on the use of the word "architect" as a title, and the training of architectural students. Of the technical subjects on the agenda-paper, the most important refers to fire-resisting construction, whilst in the business part we find a proposal to found an official journal for the amalgamated societies. As to the proposed union between architects to prevent the publication of their designs (for we presume that is what is meant), German architects would do well, before they commit themselves to any rash action on this head, to compare their native architectural journals with those of England and America, where the principle has been long adopted that publication of an architect's designs is not a disadvantage to him, and where drawings are freely lent for publication. As far as our experience goes, the only thing the average German architect usually considers when any proposal is made to publish his designs, is what he can get for them, rare exceptions to this rule only being found among the really prominent members of the profession. This, no doubt, partly accounts for the absence of any decently-illustrated architectural paper in Germany.

WE have been asked to give publicity to the terms of the following memorial in relation to the decision in the Durham County Buildings competition, which is to be formally presented to the County Council of Durham as soon as the signatures of all the competitors who are willing to sign it have been obtained:—

"4, Ludgate-circus, E.C., August, 1895.

TO THE CHAIRMAN AND MEMBERS OF THE DURHAM COUNTY COUNCIL.

GENTLEMEN,—We, the undersigned, with very great pleasure and considerable hard work, responded to your invitation to submit designs in

* W. J. Pink's "Clerkenwell," edited by E. J. Wood, 1881.

open competition for the new council house and offices in Old Elvet, Durham, under conditions, which we humbly submit have certainly not been fulfilled in the spirit in which they commended themselves to us all. The result is that a gross injustice has been done to honourable and brilliant professional gentlemen, by their being set aside, without any valid reason, as if incompetent and unworthy, and local men, more or less unknown, substituted, who by your assessor's award had not earned the honour of being entrusted with so important a public work. We therefore humbly and respectfully pray you to remove this most unmerited slur and bitter disappointment, by entrusting Messrs. Cooksey & Cox with the work they fought for and so gallantly won, and thus not only earn the esteem of the competitors and profession generally, but we earnestly believe, act in the best interest of those you represent.

PHILIP TREE & IVOR PRICE.

Hon. Secs. for the Competitors.

The Hon. Secretaries will be glad to hear at once from competitors who wish to add their names. This is a movement which is very honourable to all concerned in it, since it is entirely an unselfish effort, on the part of competitors who have not been successful, to obtain justice for those who honestly gained the competition.

BRASS OF WILLIAM GREVEL AND WIFE, CHIPPING CAMDEN, GLOUCESTERSHIRE.

THE figure of William Grevel, "Flos mercatorum, Anglie," as described in the inscription, is in a long cloak buttoned on the shoulder. At the opening may be seen the light-buttoned sleeves of an undergarment terminating at the wrists.

Round the waist is worn a belt, from which an anelace is suspended. The hair is close cropped, and a short peaked beard and moustache are seen. The wife's figure is enveloped in a long dress buttoned the whole length, and at the wrists may be seen the short sleeves of an under-garment, similar to that on the other figure.

The nebule headress is worn, the ends falling on the shoulders.

The canopies over the figures are of an ogee form, and in the centre compartment of each is seen the merchants' mark. The central shaft is mutilated. At the foot runs an elaborate basement upon which the principal figures are placed. Shields of arms are placed (one lost) on either side of the finials of the canopies.

A marginal inscription completes the composition.

ANDREW OLIVER.

ARCHITECTURAL ASSOCIATION ANNUAL EXCURSION.

IN giving our usual record of the proceedings of this annual and always interesting expedition of the Architectural Association, with an account of the places visited, we may observe in the first place that the greater number of the illustrations *en route*, which have been prepared to accompany the account, will be found in next week's issue of the *Builder*, where also the greater portion of the account, that of the last four days of the week must appear. It had been intended to divide the lithographic illustrations between this issue and the following, but we thought it desirable to devote a portion of our lithograph illustrations this week to the publication of the first premiated design for the Durham County Council Buildings, the circumstances connected with which are attracting a good deal of attention, both in justice to the authors of that design and to enable those who are invited to support them to form an opinion on its merits. The main part of the illustrations connected with the Architectural Association excursion will therefore be published *en bloc* in our next week's issue, along with the latter portion of the account.

TWENTY-SIXTH ANNUAL EXCURSION.

The twenty-sixth annual excursion of the Architectural Association is now in progress, with Cheltenham for head-quarters, and the adjoining parts of Gloucestershire, Worcestershire, and Oxfordshire, forming the area which is being visited. In accordance with the usual custom the majority of the excursionists gathered at the Queen's Hotel, Cheltenham, on the Saturday, and spent Sunday together in Cheltenham and in short informal excursions, but the official programme of the week commenced on

Monday.

The weather, of course, is the first thought of an excursionist, and hence our party were hap-

* On the Baker estate, *conf.* Baker-street, Lloyd-square, Hardwick-street, &c. Thomas J. Lloyd Baker, of Hardwick-court, Gloucestershire, born 1777, was the son of the Rev. W. Lloyd Baker, by Mary only daughter of the Rev. John Lloyd, rector of Ryton, co. Durham.



Brass of William Graet and wife: 1401. At Chipping Camden, Gloucestershire. Size, 8 ft. 6 in. by 4 ft. 5 in.
From a Rubbing by Mr. Andrew Oliver, A.R.I.B.A.



Architectural Association Excursion: General Map of the District visited.

ECKINGTON BRIDGE
OVER THE AVON.



Width between parapets 12.6
Contract Span Pier to pier 25.6.

on starting under a clear sky, and with the prospect of a fine day. Fortune favoured them throughout the day, as the only showers that fell occurred during the halts, so that no inconvenience was experienced.

The first halt was made at the village of Southam, where the programme indicated the objects of interest as a Norman chapel and the farm houses of Pigeon House Farm and Manor House Farm. These were inspected in that order. The Norman chapel is, as regards its oldest parts, of very early date, but having been allowed to fall into disrepair, much of what now exists is modern, it having been restored by Edward, Earl of Ellenborough, in 1861. The chapel, as restored, is a veritable museum, including Indian marble carving in the font and sedile, German or

Flemish pictures, Italian candlesticks, and various other importations, even to an Indian shield and tulwar. The chapel appears to have been connected with the Pigeon House Farm, in the grounds of which it stands.

The farmhouse and farm buildings are picturesque, but without much architectural interest beyond a couple of stone windows of Early Decorated type, which seem to indicate that considerable antiquity attaches to some, at least, of the buildings. Some seventeenth-century gates and piers are pleasing in their proportions and general treatment, though the mouldings are marked by the coarseness of detail, which is so frequently to be noticed in English work of the Early Renaissance. Amongst the curiosities of Pigeon-House Farm is a very antique cider-press,

somewhat suggesting a modern pug-mill, and consisting of a heavy stone rolling wheel rotating in an immense rudely-formed pan of very hard stone. Its precise date it is difficult to assign with any degree of accuracy, but it is still used every autumn.

The Manor House Farm is of far more architectural interest. L-shaped on plan with the entrance and stair at the re-entering angle, it presents a stone front to the road with half-timbered treatment at the rear. On close examination it is difficult to find any of these timbers more than 1½ in. thick, planted on to a brick backing and plastered between. There appears no reason to doubt that this work is original and coeval with the stone front, which bears a date-stone inscribed with the initials F. B. and A. B., with a heart



between, the former on the dexter, the latter on the sinister side, and below the figures 1631. We may, therefore, conclude that the sham half-timbering of our nineteenth century has at least one prototype of more than 250 years standing. There is no lack of good design in the house, the grouping and the detail of the stonework are alike excellent, whilst internally there is a very good staircase, a stone fireplace, and several doors of the ledged type, with panel mouldings planted on the face, which gave much employment to the pencils and 2-ft. rules of the party.

After two-and-a-half hours had been profitably and pleasantly spent at Southam, the excursionists proceeded to Bishop's Cleeve, situated on the rise of the Cotswolds, which has suggested that its name is derived from the Saxon term *cliv*, "a steep ascent," and its prefix given to distinguish it from Prior's Cleeve, it having been the property of the Bishops of Worcester, whose ancient residence afterwards became the rectory-house.

The chief object of interest in Bishop's Cleeve is the church, dedicated to St. Michael. This afforded the visitors much food for speculation and discussion, the original Transitional church having been considerably altered at various times. The primal plan appears to have followed with tolerable exactness that of the dominating example of the district, Tewkesbury Abbey, and to have consisted of a cruciform church, with ambulatory aisles to the nave and around the eastern apse. A central tower and two western turrets, with western entrance and south porch, were also part of the original structure. The principal modifications were made in the Decorated period, a new chancel was built, and a wide north aisle took the place of the narrow ambulatory on that side. At this time, probably, each alternate pier of the Transitional nave arcade was removed, as it is difficult otherwise to account for the exceptionally wide span and three-centred form of the arches of the nave arcade. A south aisle was added at a somewhat later date, but in this case the line of the old ambulatory was preserved in order to avoid interference with the rich Norman, or rather Transitional south doorway. The central tower, which seems to have had a spire of some kind,

fell down in 1696, and the present tower was erected in its place in 1700, at which time the church "underwent a thorough repair," when possibly the magnificent and exceedingly beautiful western gallery was erected. This feature of the church is not only remarkably excellent in design, but is most cleverly planned to avoid any interference to the fabric of the church, and we sincerely hope that the mad idea now entertained of shifting its position to a meaningless and utterly inappropriate location in the north aisle will never be realised.

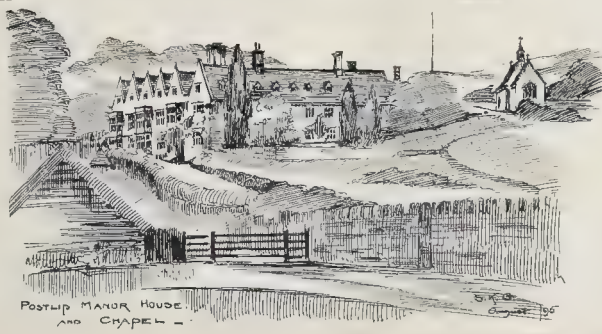
At least two additional altars besides the high altar existed. In the north transept there exist an altar-piece and the remains of a fresco painting of the Crucifixion, with the figures of SS. Mary and John, a crowned figure with an arrow, probably St. Edmund, and a fourth, whose iconography it is difficult to determine. Another altar is indicated in the north aisle by an altar-piece and the capping of a Perpendicular reredos.

Amongst other points of interest in the church are the sloping floor of the chancel, a very fine Renaissance tomb at the east end of the south

aisle, belonging to the family of Baghott de la Bere, a wall-tomb, with canopy of fourteenth-century date, ornamented with curious ball-flowers, and with an earlier figure in chain-armour, the mail having been executed in gesso.

From Bishop's Cleeve after luncheon, a climb up the Cotswolds brought the party to Postlip Hall, a most charming example of an early seventeenth-century manor-house, erected by Giles Broadway about the year 1614, which date is inscribed on the interior woodwork. Postlip has the distinction of never having been the property of a titled owner; its pre-Norman holder in the time of Edward the Confessor was Godric; his successors, Ansfred de Cornelle and William de Jolley, were "franklins," and so it continued. This William de Jolley was the builder of the Chapel of St. James in A.D. 1100, which, adjacent to the house, had nevertheless fallen into neglect and ruin until it was quite recently restored for divine worship, and blessed on June 16, 1891, by the Bishop of Clifton.

The chief glory of the home of Giles Broadway is the drawing-room, richly panelled and with



very remarkable carving in frieze and stone chimney-piece. Nor is this room merely a richly-ornamented apartment, it is pre-eminently an exceedingly pleasant and eminently "liveable" room, and many of the party spent most of their time therein. Although the chief, this is not by any means the only charm of the house; the dining-room, the hall, and the morning-room on the ground floor all contain examples of carving and of woodwork, as well as of planning and arrangement which go far to make the house an ideal country home. The staircase is singularly lacking in detail, and winds around a great solid wall in a manner more suggestive of the London County Council than of the seventeenth century. The exterior is no less delightful than the interior. Both the principal fronts, with their many gables, and the internal courtyard, are models of quiet and picturesque design, without fuss or fidget, yet full of grace and charm. Thus Postlip formed a capital and satisfactory ending to the first day's work.

Tuesday.

The second day of the excursion was heralded by drenching rain, which continued till midday, with scarcely a moment's intermission. Thus the visit to Tewkesbury resolved itself almost entirely into an inspection of the interior of the abbey (illustrated and described in the *Builder* series of "Abbeys of Great Britain," December 1, 1894). The inspection was very thoroughly made, and considerable discussion took place on the many interesting problems which the abbey presents to the architect and the archaeologist. Especial attention was given to the old stained-glass, with its representations of the great patrons of the church, from Odo and Dodo, Dukes of Mercia, who, in 715, founded the first monastery, to Robert Fitz-Hamon and the Despensers.

The rain and the large demands on their time made by the abbey gave little opportunity to the excursionists to study and sketch the many examples of ancient Domestic work in which the town abounds, and which strikingly illustrate the commercial success of Tewkesbury in the fifteenth and sixteenth centuries, which only gave way to the supremacy of Bristol at the close of the seventeenth century.

After noon the weather cleared, and a new introduction to these excursions in the form of a boating trip was therefore duly appreciated. The party were conveyed by steam-launch up the Avon to Strensham, renowned in history for the siege it sustained against the Parliamentary forces, and for the signal bravery displayed by the then lord of the manor, Sir William Russell, both here as well as in the memorable battle of Worcester. Strensham also possesses interest as the birth-place, in 1612, of Samuel Butler, the author of "Hudibras."

The visitors' time, however, was devoted to the church, with its numerous monuments to the Russell family, not omitting the brasses, of which there are several, the earliest dated 1405 to Robert Russell. The church is not large, but the square western tower is good, and commands an extensive and remarkable series of views. The rood-screen has been transformed into a western gallery, whilst an old oak lectern, Medieval tiles, fifteenth and sixteenth century pews all contribute points of interest.

Leaving Strensham, the party returned by the launch to Tewkesbury, and thence by rail to Cheltenham.

We shall continue our account of the excursion next week.

THE BRITISH INSTITUTE OF PUBLIC HEALTH: CONGRESS AT HULL.

The fourth Annual Congress of the British Institute of Public Health has just been held at Hull. The actual business of the Congress commenced on Friday in last week at Hymers College, and the Presidential addresses were delivered in the four sections into which the Congress is divided. The sections were: (A) Preventive Medicine; (B) Chemistry and Climatology; (C) Municipal and Parliamentary; and (D) Sanitary Engineering and Building Construction.

The President of Section A was Dr. Spottiswoode Cameron, who delivered an address on "Sanitary Reform." In the course of his concluding remarks he said that the introduction of a Notification Act enabled the medical officers in many large towns to press for the examination of every house in which an infectious disease was known to have occurred. Where this was done it was soon found that serious sanitary defects had often existed in

dwellings entirely unknown to their occupants, and of which, consequently, had an infectious disease not broken out, nothing would have been heard. These circumstances strengthened the hands of those who were already pressing upon their authorities the desirability of systematically examining their districts. In one town of which he knew something every house was examined in that systematic manner. Certain information as to the number of occupants, the number of rooms, the means of ventilating them, the nature of the water supply, the kind and efficiency of the drainage arrangements, the sufficiency and situation of the sanitary conveniences, was collected, along with additional information as to any complaints made by the occupiers about nuisances in the dwelling or its immediate neighbourhood. Without claiming that of the most important of the improvement in the health of that town was due to such examination, he would, however, remark that the death-rate, which had averaged for the five years preceding this house-to-house examination 22.3, had averaged during the last five years only 16.6, an improvement of more than 16 per cent. Had the Authority insisted on the removal of all sanitary defects so discovered, the improvement would probably have been even greater. Examinations thus made, sometimes in pursuance of a systematic plan, sometimes on account of the outbreak of disease in the near neighbourhood, had again and again revealed the existence of dangers to health of the most appalling kind. To find, for instance, in a row of new houses, in one of which a case of diphtheria had appeared—houses built under modern by-laws and carefully inspected when built—houses with every waste-pipe cut off from the sewer, and all the sanitary conveniences outside the dwelling—that a strong smelling chemical introduced into the sewer penetrated into the house itself in seven out of ten, was startling indeed. That indicated, of course, that there was a distinct connexion between the air of the sewer and that of the house, and showed the importance of investigating these conditions, even in houses as to the sanitary condition of which no complaint had ever been made. Such instances, he feared, were not uncommon. They went to show that even modern building by-laws, carefully carried out by able inspectors, would not necessarily guarantee a few years later the healthiness of a house. But what about houses constructed where the by-laws were not modern? In all these large towns there were many houses with wastes not severed from the sewers. In a recent investigation on the outskirts of a large town of some hundred contiguous houses, all more or less recently built, and of which nearly two-thirds had all their wastes cut off and the remaining third not, it was found that the smell of a chemical entered the house through the drains in 19 per cent. of the former and in 60 per cent. of the latter. Such instances as these, which could doubtless be multiplied from every large town, seemed to point strongly to the importance of a systematic examination of all houses, old and new, house by house, street by street, ward by ward. It was now universally admitted that the inhabitants of large towns must be provided with an adequate supply of pure water; that food offered for sale must be strictly and carefully inspected; that ash-pits and court-yards must be frequently and periodically cleansed; that the healthy must be protected from contact with the infected. And yet in how many cases did workmen follow their employment in damp or confined workshops? How many persons live in unwholesome dwellings? and they heard no word of complaint till some infectious disease broke out or someone died. Was it not, he repeated, rather their duty systematically to visit all houses, all workshops, and ascertain beforehand whether the conditions there present were those which favoured or destroyed the health of those they were intended to shelter and protect?

Section D was presided over by Mr. W. Spinks, A.M.Inst.C.E., Lecturer on Sanitary Engineering at the Yorkshire College, Leeds, who delivered an address on Water Supply. The President, in the course of his address, said there could surely be no waste of water used for sanitary purposes, and the restrictions as to cisterns for water-closets, urinals, &c., required complete overhauling, and every opportunity should be afforded for a proper supply for the flushing of school-closets, public baths, and watering streets, and purposes of that kind, which are part of the sanitary services requisite in maintaining the general health of the community. The water should be sold at cost price, if obtained from a company, and supplied free if the local authorities are the undertakers. Imme-

diately the water for domestic consumption had fulfilled its purposes, it became necessary to have another system of conduits for conveying it away from the houses. Up to quite recent times that, in some places, had been done in a very careless way, so much so as to be a source of danger to the public health. Now, thanks to the vigilance of the Local Government Board and to the County Councils, we are within measurable distance of the time when every place, however small, will be supplied with a well-arranged system of sewers. There were points in the construction of sewers which were worthy of a little attention. It was really sad to see to come across, in so many places, a vast amount of good public money lying unproductive underground, expended on unnecessarily large sewers, and it was difficult to conceive what could have been the motives of their design. To err on the side of safety was commendable, but any excess of the limit of safety was extravagance. The ventilation of sewers remained a vexed question, and they still awaited a system that should be proved to be better all round than the open surface gratings. Like many other sanitary contrivances, this has broken down for want of management. Turning to the question of river pollution, he combated the notion which appeared to be very prevalent in many districts, and especially in the West Riding of Yorkshire, where there are few water-closet towns, that the domestic sewage which contains only a small portion of excrement could not possibly cause pollution. In addition to the pollution from sewage, there was a grosser one of pollution from trade effluents. There were just two points in connexion with that problem that he would like to submit to them, first as to the equity of compelling manufacturers to pay rates in aid of sewerage and sewage disposal system, and then calling upon them to deal with their own liquid refuse at their own expense. Another branch of public sanitary engineering, to which he would like to refer, was the care and maintenance of roads. An ideal roadway surface should approximate as nearly as possible to a plane surface, so as to reduce the friction to a minimum, and consequently to increase the value of the tractive force exerted. Noiselessness and cleanliness were also important considerations that must be weighed up. Whatever pavement was considered best, it was after all only the veneer—the foundation was really the most important feature in road construction, and unless that was sufficiently durable, and finished true, and in parallel lines to the surface, an even face could never be maintained on the pavement. Of course, granite pavements were not suitable in residential neighbourhoods, or in streets where retail business or office work was carried on, and something much less noisy, if not so economical, must be used. The asphalt pavement, formed from the natural mineral asphaltes, present a splendid surface, and could be kept very clean, but the noise caused by the striking of the horses' hoofs was a great objection. Wood pavements were not nearly so durable nor so cleanly, but they certainly carried off the palm for noiselessness. Since 1883, a new timber had been introduced from the forests of Western Australia, which is nearly as hard as teak, and has an absorption capacity not exceeding 10 per cent., and from a sanitary point of view it is claimed that the well-known antiseptic properties of the eucalyptus will prove an important feature in its favour. It possesses a natural oil in some degree equivalent in its action to the creosote forced into the deal blocks, and from experience gained in London it would appear the life of this class of pavement is likely to be fifteen years, and whilst the first cost is considerably higher, yet the annual charge for interest and sinking fund will not amount to more than 1s. per square yard, as against 1s. 1½d. for creosoted deal, whilst the cost for maintenance and repairs must, of course, be considerably less. Turning to sanitary building construction, the President said that the preparation of a site before building operations commenced seemed to be an art but little practised, if one excepted the making of them by tipping all kinds of undesirable refuse. It was really deplorable to come across so many commodious, well arranged, and excellent houses, save for the fact that absolutely no provision had been made for dealing with the sub-soil water. Before a brick was laid the nature of the strata underlying the basement level should be ascertained, and especially where the house was to be built on the slope of a hill. It frequently happened that these very important precautions were entirely neglected by the architect, and subsequently, probably on the occasion of

an outbreak of enteric fever, investigations were made by a sanitary engineer, which revealed the absolute necessity of measures for dealing with sub-soil water, and it was clear that whatever steps were undertaken for the purpose, after the erection of a house, could not be altogether satisfactory, and must likewise be more costly than if executed at the beginning. The principles of house-drainage should be perfectly understood. The two great stumbling-blocks and preventives had hitherto been the practical surveyor, who was considered to be *an fait* in drainage, and the odd man, who was deemed quite good enough to lay a pot-pipe. It was high time the worship of these idols ceased, and that the importance of having house-drainage designed by an expert was recognised. With regard to dry house-refuse, he said that no system of refuse-disposal was complete, and could not be satisfactory, until the questions of storage and removal were set on a right footing. Objections to the working of a refuse-destroyer could not be made, for the time had gone by when it could be stated that the destructor was a nuisance to health, because they all knew that they could be so constructed and worked that neither gases or dirt would escape, provided the material was consumed as fast as it arrived at the depot. On the question of house sanitation at watering-places the President spoke very strongly. Every hotel, hydropathic establishment, and lodging-house, before the commencement of the visiting season, should undergo a sanitary survey, and if found to be in a satisfactory condition, a certificate of its sanitary fitness should be issued, conditional upon its being hung in such a position in the establishment as to meet the eyes of everyone proposing to put up there. Nine-tenths of the people were entirely apathetic about those matters at home, and it was for the protection of such people when they went from home in search of health that he called for these necessary safeguards. He also appealed for proper sanitary provisions in private schools. Generally an ordinary dwelling-house served the purpose, and the arrangements suitable for a family of normal size were quite inadequate for thirty or forty children.

Mr. T. Blashill (London) moved a vote of thanks to the President for his address.

Mr. Edwin T. Hall (London) seconded the resolution, which was carried.

Mr. Blashill then read a paper on "Artisans' Dwellings in Flats," and was accorded a hearty vote of thanks for the same.

Mr. E. Manville, M.I.E.E., in reading a paper upon "Refuse Destruction as Applied to Electric Lighting Purposes," said that the attention given to the destruction of ashbin refuse had, during the past three years, materially increased, owing probably, in the first place, to the difficulty of finding suitable tips at which to deposit the refuse; secondly, to the increasing cost of the disposal of refuse; and thirdly, to the various opinions that have been expressed as to the amount of available energy that can be derived from the refuse if burned under proper conditions. The progress of the design of the dust destructor had certainly been one of slow evolution. In the first days of the design of these furnaces little seemed to have been considered beyond the means of burning, or partially burning, the refuse, without any consideration as to the treatment being carried on in a scientific manner, and, doubtless, this had had a great deal to do with the prejudice which still exists in many places as to the presence of such an installation within a large city or town. As long ago as 1892 the Vestry of St. Leonard, Shoreditch, having in view the erection both of a Central Electric supply station and of a dust-destructor, he, in his capacity of their adviser, strongly recommended them to combine the two schemes. After careful investigation he felt enabled to assure them that all the steam required for the estimated electrical output likely in the first instance might be obtained from a properly designed dust-destructor. In arriving at that opinion he experimented on a large scale with samples of ashbin refuse, collected at a season of a year when household fires were not much in use, and he found it was extremely rich in carbon. Indeed, when the unsorted refuse was burned directly in a boiler it evaporated as much as 3 lbs. of water from and at 212 deg. Fahr., and his opinion that the steam required could be obtained from the burning of this refuse in a properly-designed arrangement of destructor-cells and boilers was founded on the supposition that only about one-third of the calorific value of the refuse would be utilised in the boilers, after due allowance had been made for the complete and perfect combustion of the ashbin refuse and its

gases. The Vestry resolved that such a combination should be erected.

A vote of thanks was accorded to Mr. Manville, who, in acknowledging it, said that he agreed they could not generate the power as cheaply as on coal, but they must remember the refuse had to be burnt, and whatever they gained by utilising the gases was a pure and absolute gain.

Mr. R. S. Roundthwaite (Borough Engineer, Sunderland) followed with "Notes on the Construction of Infectious Diseases Hospitals, with special reference to the buildings erected for the Corporation of Sunderland." He said that in the first place the site should be reasonably removed from the vicinity of all residential and other inhabited property, though not necessarily to the middle of a moor or common, and it should likewise be within a reasonable distance of all parts of the district proposed to be served. In the second place, he thought the site should, if possible, have a gentle descent from the north and east to the south and west, and the brighter and more cheerful the aspects the better, for few things tended so much to assist a man and woman in fighting against disease as cheerful surroundings. The subsoil should, if possible, be of a light sandy nature, rather than heavy and clayey, so as to admit of quick surface drainage. There should be no thought of attempting to deal with even the small amount of sewage gathered from the various buildings upon land near the site; it should be carried right away to precipitating tanks as far from the hospital as possible, and there treated. With regard to the amount of accommodation required and the number of beds, the officials of the Local Government Board considered they should provide one bed for every 1,000 inhabitants. For Sunderland that would mean 140 beds, but they had deemed it sufficient to provide for fifty-two, although, no doubt, it would be necessary in the near future to make one or more additional pavilions. As to whether the wards should be one or two stories high, he thought the general consensus of opinion was in favour of one story. Personally, he was of opinion that covered corridors to be of any service as a protection against the weather, must seriously interfere with perfect isolation, and if they were constructed with the roof only and the sides from 3 ft. to 4 ft. high from the floor, they were cold and draughty, and worse than nothing at all. If they must be provided, he thought a double corridor with a central division was the best form to adopt. He was strongly of opinion that pavilions of the single story type were the best, with the nurses' duty-room placed centrally, so as to command the wards on either side. Another most useful and essential building was an isolation pavilion, the necessity for such lying in the fact that very frequently the preliminary symptoms were not sufficiently marked to enable the medical practitioner to pronounce with any degree of certainty the particular disease which the patient would develop.

Mr. Thomas D. Aldwinckle (London) also gave a paper on "The Planning of Fever Hospitals." Speaking generally, he said it had been assumed that the provision of one bed per thousand inhabitants was sufficient for the permanent requirements of a sanitary district, but such requirements would necessarily vary with the character of the population. There should be two entrances to a hospital, one the infected entrance, and the other the non-infected entrance, both controlled from the same porter's lodge, a wide roadway running round the whole as a neutral zone to separate the hospital from the surrounding property. All the buildings of an infectious hospital should be completely isolated, and stand perfectly free, without communicating corridors or covered ways of any kind. There should be two receiving-wards, one for scarlet-fever and one for diphtheria and enteric fever. Those two wards should not adjoin, but should be as near as possible to the wards of their respective diseases. It was undoubtedly an advantage for a convalescing patient to be removed from the disturbing surroundings of an acute ward as soon as possible. The warming and ventilation of the wards must be considered as one operation, and must also be dealt with in close relation to the climate. The key of the whole position was that for at least 300 if not 350 days in the year it was possible to open the windows of a hospital ward without danger or discomfort to the patient.

Mr. Baker (Middlesbrough) moved a vote of thanks to Mr. Roundthwaite and Mr. Aldwinckle, which was seconded by Dr. Sargent (Preston).

Mr. Edwin T. Hall recommended that in designing infectious hospitals for a growing town, the administrative portions should be erected in excess of immediate requirements, and rather with the view to the ultimate size con-

templated as a maximum. Experience had shown that for safety a zone of 40 ft. between infected buildings and the boundaries of the site was sufficient, but, among other reasons, having regard to the natural sentiment of the neighbours, it was better to make this 80 to 100 ft. Two-storied pavilions should have no means of internal communication whatever, and all pavilions should be so separated as to allow of light at an angle of 22½ deg., with the horizon striking the base of the external wall.

The votes of thanks were then agreed to. A garden-party was afterwards given at Tranby Croft by Mr. and Mrs. Arthur Wilson, and a dinner was held in the evening at the Royal Station Hotel. The work of the Congress was continued on Saturday, Monday, and Tuesday.

COMPETITIONS.

INFIRMARY, TENDRING, ESSEX.—At the last meeting of the Tendring Guardians, held on the 7th inst., the Clerk read the report of Professor T. Roger Smith upon the plans of the proposed workhouse infirmary which had been submitted to him. The report recommended the design of Mr. F. Whitmore, of Chelmsford, for adoption, it being, in the opinion of the Assessor, the most compact and suitable design of those sent in. It was resolved that, before adopting any plan, Mr. Whitmore be asked to state for the Board's information what his inclusive charges would be for preparing all necessary works, plans, and superintending the execution of the work.

Correspondence.

To the Editor of THE BUILDER.

DURHAM COUNTY BUILDINGS.

SIR,—The recurrence of bad faith in the promoters of competitions seems to be epidemic, and we have the latest exhibition of this kind of procedure on the part of the Durham County Council.

Everything seemed fair and straightforward; an important and difficult subject was proposed, an exhaustive number of drawings asked for, an assessor promised, and a protective deposit of 51. 5s. was required. The conditions were issued about July of last year, and the publication of the result was put off again and again and delayed until some two months back.

In conjunction with my friend, Mr. Gerald C. Horsley, I submitted a design, only recently returned. We, as other architects, would not have competed had we considered the conditions to be anything but honourable and above suspicion, and we loyally accepted the assessor's award, though we have not seen Messrs. Cooksey and Cox's design. That the profession should be insulted by such iniquity is abominable, and it is to be hoped the Durham County Council will put themselves right with the public in repairing their breach of rectitude by entrusting the work forthwith to the successful competitors.

WILLIAM A. PITE, F.R.I.B.A.

11, Hart street, Bloomsbury-square, W.C.
August 12, 1895.

THE INSTITUTION OF JUNIOR ENGINEERS.—The annual summer meeting of this Institution, whose headquarters are in London, takes place from August 17 to 24, the rendezvous being Belgium. The towns to be visited include Antwerp, where the municipal docks, M. Kryn's diamond-cutting works, and other places of interest will be opened to members' inspection. At Ghent, MM. Carels' engine-works, M. de Hemphinne's cotton-spinning works, and M. Van Houtte's nursery-gardens will be seen; at Brussels, the electric-lighting station; whilst at Liège the works of the Société Cockerill, the Vieille Montagne zinc-works, the St. Leonard locomotive-works, the Val St. Lambert glass-works, the small-arms factory, and the Electric Tramway Installation will be visited. In honour of the Institution a banquet is to be given by the Liège Section of the Society of Engineers from the University, and the members will also be the guests of the Société Cockerill. An excursion to Verviers, where the Chamber of Commerce will entertain the visitors, is arranged for the purpose of seeing works in connexion with the woollen-cloth industry. Here MM. Peltzer's works, and those of M. Duesberg-Delrez, La Vedre, and M. Hauzeur Gern's will be opened. The celebrated Gileppe reservoir, from which Verviers receives its domestic and manufacturing supply, is also included in the programme. A large number of members have notified their intention of being present at the meeting, which promises to be one of the most successful the Institution has held.

Illustrations.

LECTURE HALL, IMPERIAL INSTITUTE.

THE drawing, which was one of those hung in the Architectural Room at the Royal Academy this year, shows the exterior of the projecting wing containing the Lecture Hall, with its rather peculiar but very original porch. The treatment of the exterior with the large amount of blank wall and the range of small lights above, aptly expresses the nature of the purpose of this portion of the building. The deep setting of the windows, with the double colonnettes in front of each pier, is a very effective incident in the architectural treatment.

The architect, as all our readers know, is Mr. T. E. Collcutt. The illustration is a good example of the care bestowed by him on the treatment in detail of the various portions of this great building.

DURHAM MUNICIPAL BUILDINGS.

THE authors of this design for the new County Council Buildings in Old Elvet, Durham, which was placed first by the assessor in the recent competition, are Messrs. Cooksey & Cox, of Charing Cross. The ground floor of the building is raised somewhat above the level of the streets, and is approached through a vestibule into a circular hall, from which opens the committee-room corridor and that giving access to the offices of the Clerk of the Peace, which overlooks Old Elvet. The Council Chamber and committee-rooms are all *en suite*, and form a department by themselves, arranged along the west side of the site. Part of the east side is occupied by the offices of the weights and measures department, while a large area is still left for the future extension of the building. On the first floor over the office of the Clerk of the Peace is the engineer's department, while that over the committee-rooms is given up to the accountant and the members' tea-room, which is placed at the head of the staircase leading from the Council chamber. On this floor are also the offices of the technical education department and the medical officer, while on the floor above are accommodated the caretaker, the lavatory, &c., for the medical officer, and the loan library of the technical education department. The basement is given up to the election and ballot-rooms, storerooms, heating and lighting, &c. The authors have chosen a style best described as a modern treatment of the English Renaissance, which will be in complete harmony with the surroundings.

SKETCHES ON THE ROUTE OF THE ARCHITECTURAL ASSOCIATION EXCURSION.

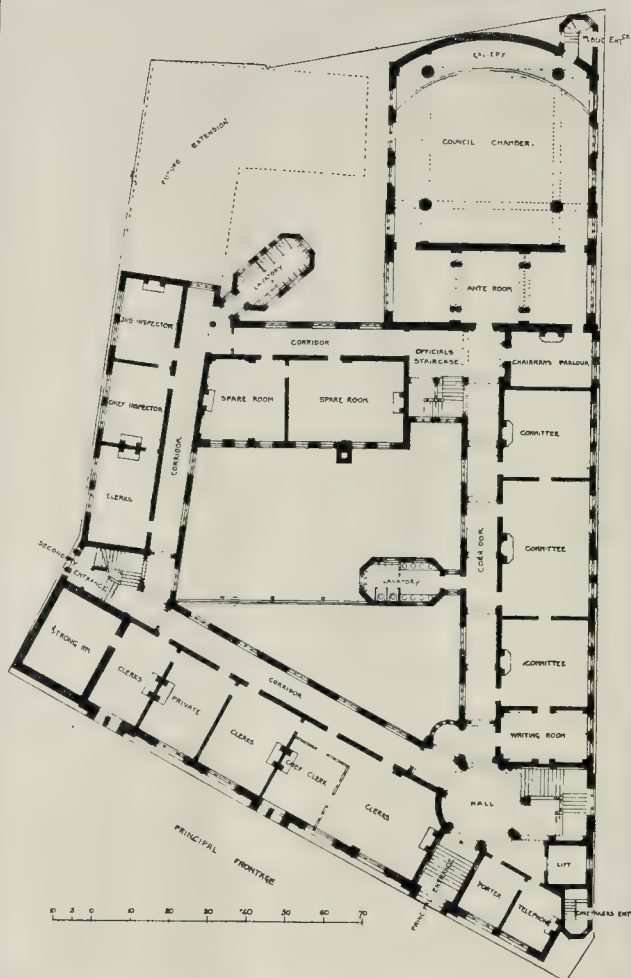
THIS page of sketches was made for us by Mr. R. W. Paul to furnish a portion of the illustrations of places visited during the excursion.

As mentioned elsewhere, the chief portion of the illustrative sketches, made for the occasion by Mr. S. K. Greenslade, will be given in the plates of our next issue. An article on the first two days of the excursion will be found on another page, and will be continued in our next.

Books.

Public Baths and Washhouses. By ROBERT OWEN ALLSOP, Architect. London: E. & F. N. Spon. New York: Spon & Chamberlain.

THIS is a useful small book on the subject, as defining and calling attention to the requirements of the various departments of a public baths establishment. A technical work treating the whole subject of baths and their arrangement and construction, in a complete and comprehensive manner, has not yet been produced, though there is plenty of scope in the subject for a large work. In the meantime, Mr. Allsop's small book will be useful as a guide and suggestion to those who are new to the subject, in furnishing a certain amount of information and directing their attention to the requirements to be studied, though we must take decided exception to the model plan of a baths establishment given as an appendix. We do not gather very clearly from the text whether this is a plan actually carried out, or one proposed as an explanatory model plan. In the former case difficulties of site may



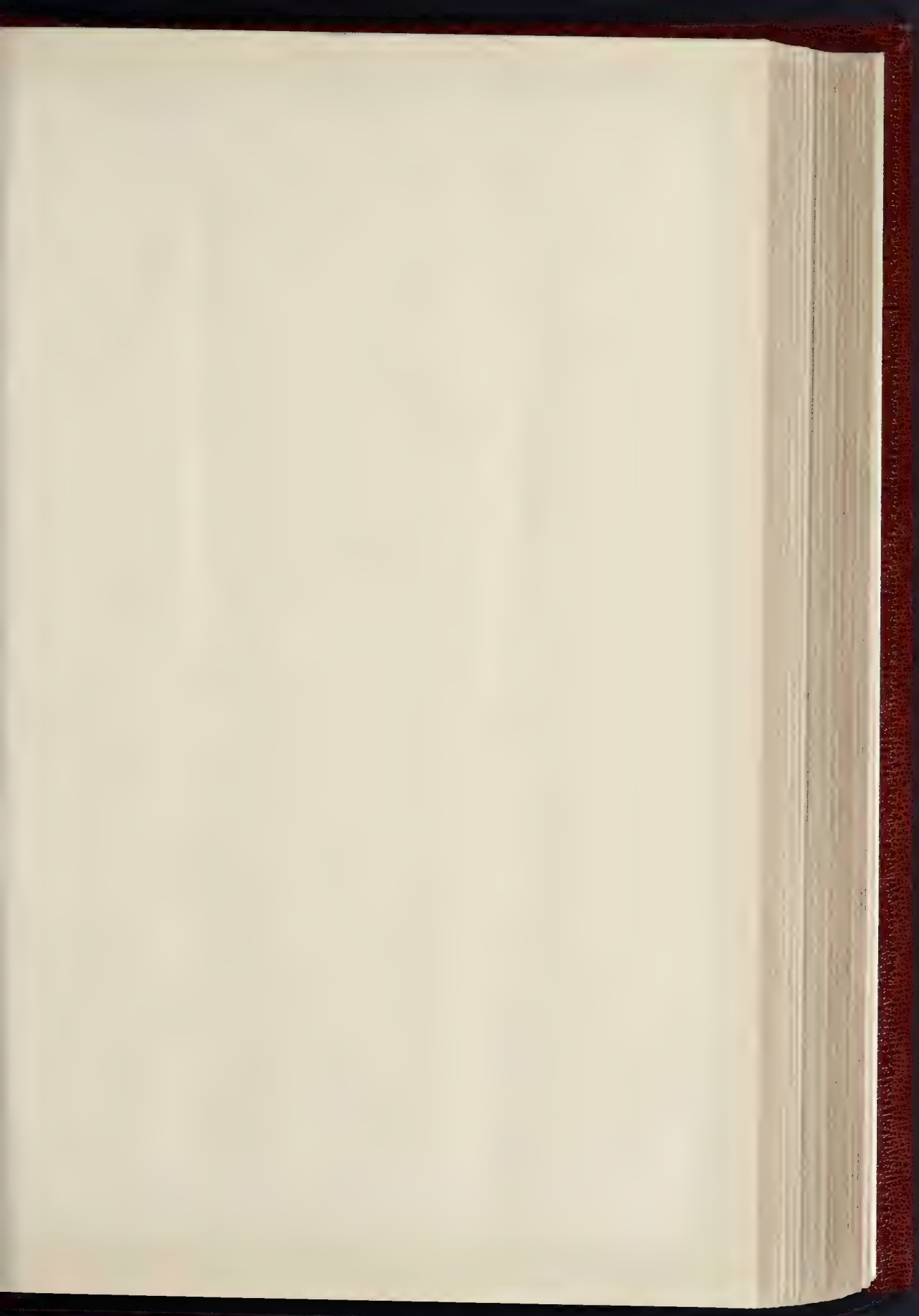
First Premiated Design for Durham County Council Buildings. Ground Plan.

be an excuse for the arrangement of the entrances, which, however, in any case is most objectionable. The object in the author's mind seems to have been economy in working, by making one ticket office with various windows serve for both sexes and both classes of bathers; and this is no doubt an important economical point, but it must be managed in a different way from that shown here. The street-door is the same for all, the entrance being up a "baths corridor" with the entrances for men and women at the end, side by side, and the two "classes" of bathers of each sex enter the same outer lobby by the same door. Many men (even) would dislike this arrangement; all ladies would, and families of the higher class would hardly like their girls to attend a bath of which the entrances were planned in this way; and rightly. We agree with the author that division into three classes is unnecessary; but where there are first and second class baths the street entrances should be separate, and where there are baths for both sexes in the same building (as is usually the case) the street entrances for men and women should also be entirely separate. The arrangement shown in the plan is absurd, and while the author rightly observes that long and complicated corridors are to be avoided, he certainly does not avoid them in this plan.

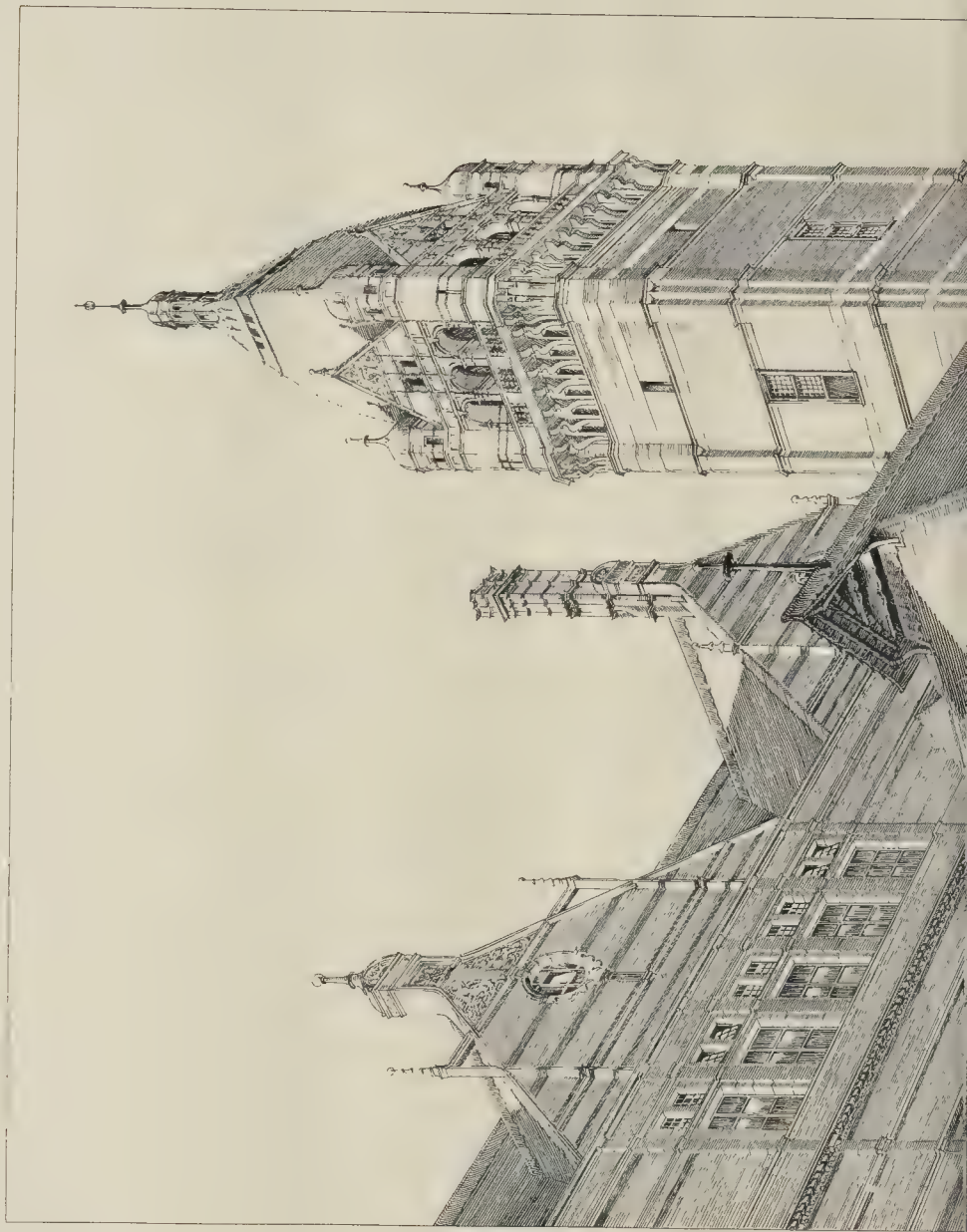
Practical information as to construction is given, and a section of swimming-bath and plans of heating and engine department, washhouse, &c. The author makes some good suggestions in regard to a scheme for providing cheap baths for

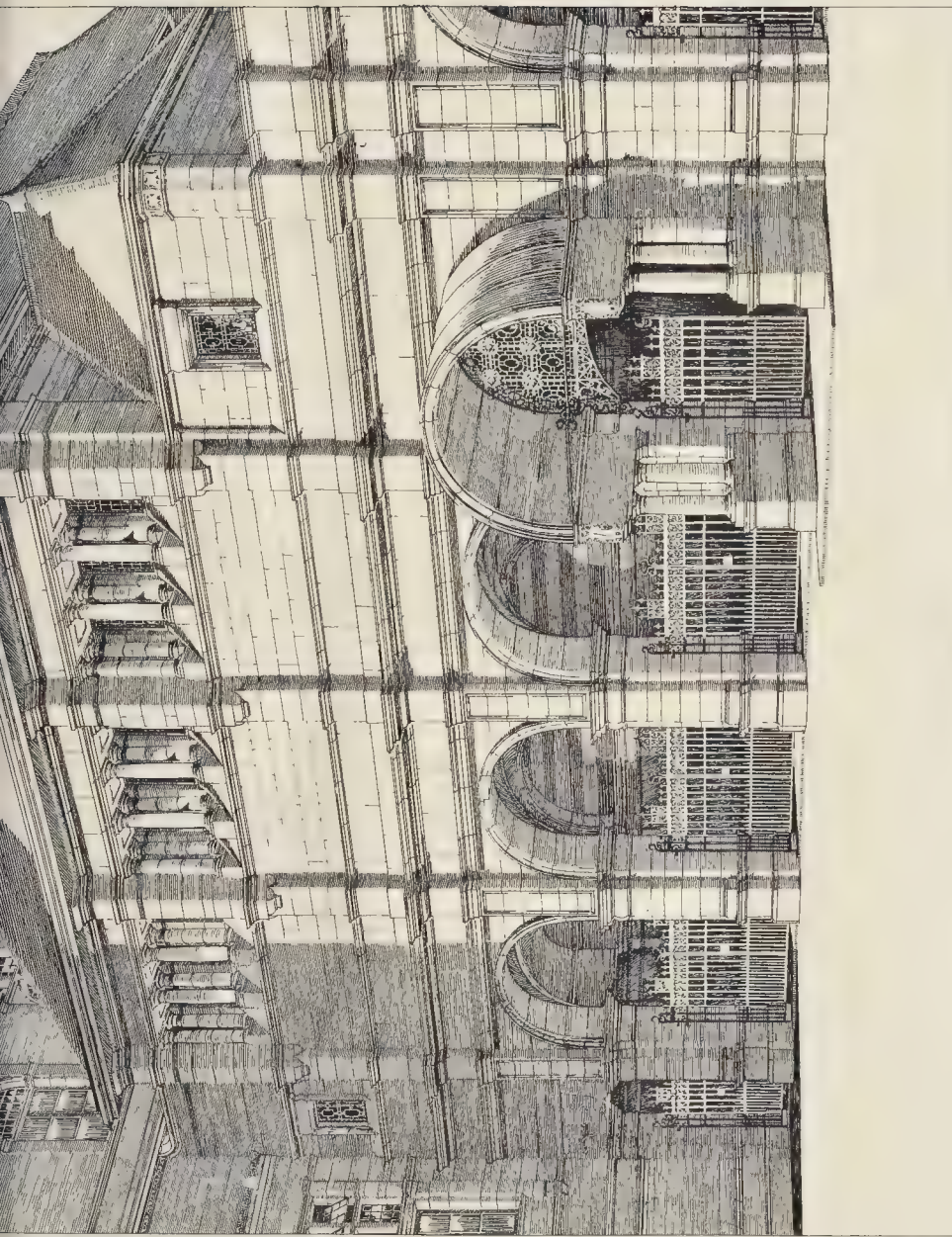
the very poor, at a penny a head, which will be found at the end of the book, and which appears to be quite practicable and worth attention. Another point to be noted in regard to the separate baths is the suggestion that a cold shower should be fixed over every slipper-bath, without extra charge, in order to permit and induce the habit of taking a cold shower as a brace before proceeding from the warm bath to the open air. That there is often danger of taking cold from this procedure is probably perfectly true, and a caution against this, and advice to use a shower after the warm bath, might be affixed in each bath, as a suggestion to the many persons who do not understand taking care of themselves in this respect. The poorer classes, especially are very apt, when once they indulge themselves with the luxury of a warm bath, to overdo the indulgence.

In regard to swimming-baths the author is undoubtedly right in saying that a long and comparatively narrow proportion is better than a shorter and wider one; it is length that a swimmer wants; and this point has in fact been practically recognised of late years, as it may often be observed that the baths of older date have the wider form, and those of more recent date the narrower. The narrow and long form has also the advantage that while the greater length is convenient to the practised swimmer, the lesser width is convenient and more encouraging to beginners who can only swim a little, and are not certain of their powers. We have before observed that the time has now arrived when the distinction in size almost



THE BUILDER, AUGUST 17, 1895.





THE LECTURE HALL, IMPERIAL INSTITUTE.—MR. THOMAS E. COLICUTT, F.R.I.B.A., ARCHITECT

DESIGNED BY MR. THOMAS E. COLICUTT, F.R.I.B.A., ARCHITECT.

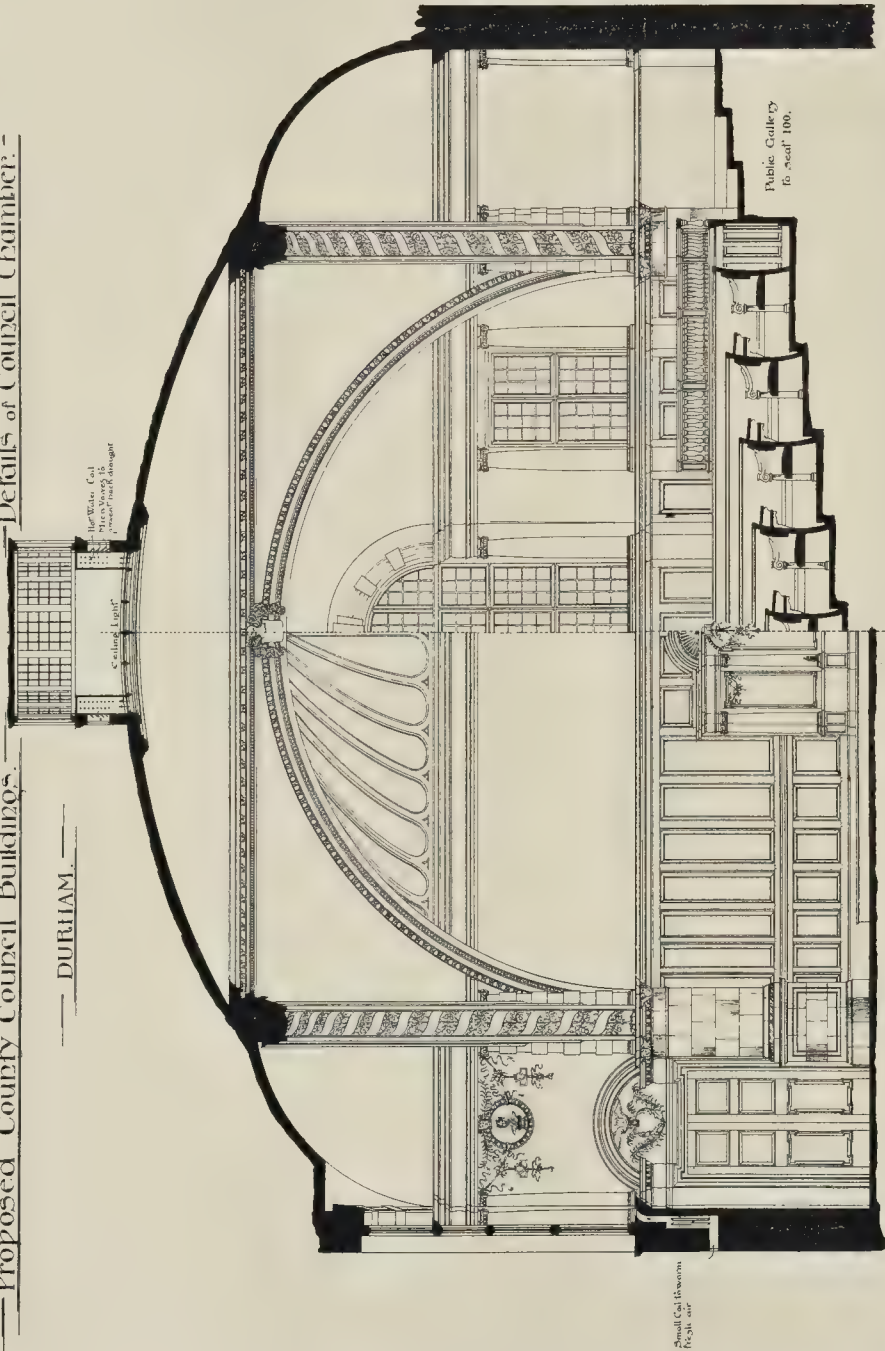


THE BUILDER, AUGUST 17, 1895.

— Proposed County Council Buildings, —

— DURHAM. —

— Details of Council Chamber. —

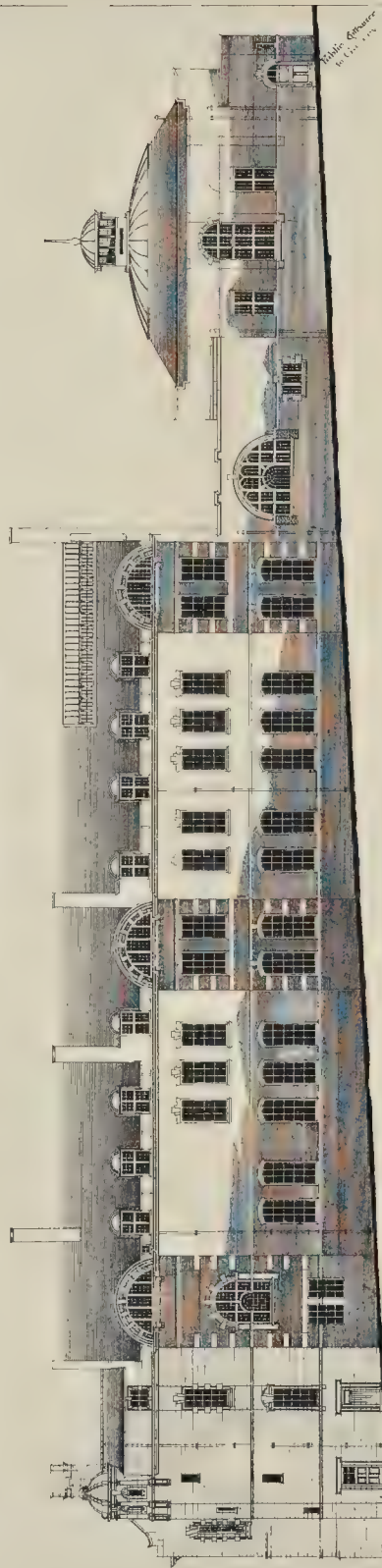






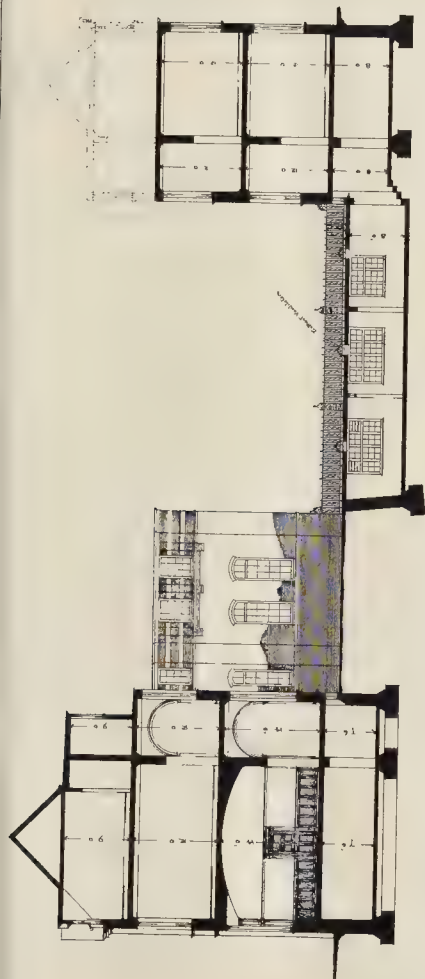
—Elevation in Old Elze—

—Elevation in Old Elze—

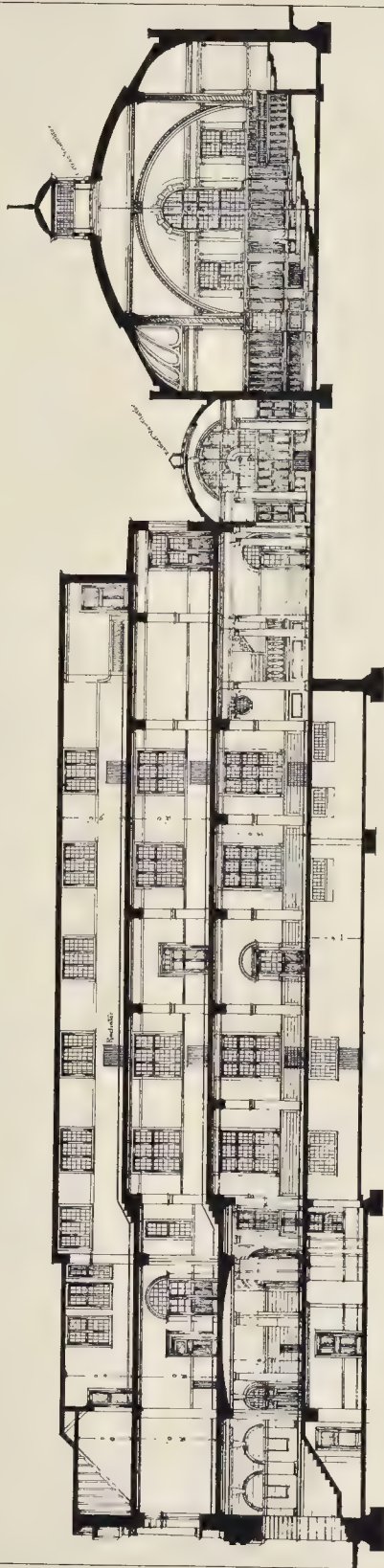


—West Elevation—

—West Elevation—

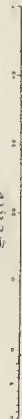


Section G-H.



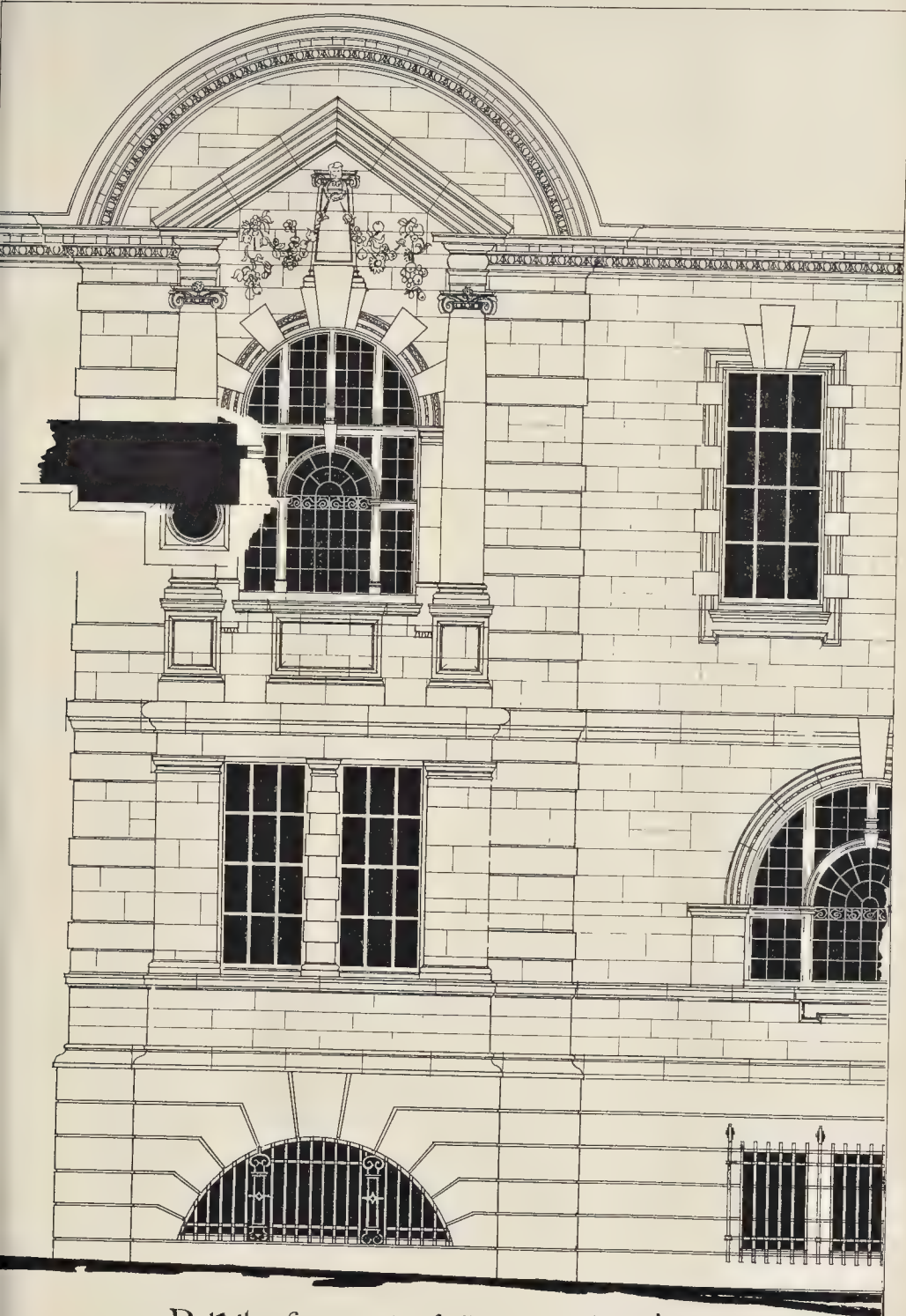
Section E-F.

Scale



PROB. AND CORR. E. & F. IN 1885. ARCHT. SHEET SEVEN AND E.

FIRST PREMIAED DESIGN FOR DURHAM COUNTY COUNCIL BUILDINGS. MESSRS COOKSEY & CO. ARCHTETS



Detail of a part of Front Elevation.

1/2" 1" 2" 3" 4" 5 Feet

PHOTO-LITHO SPRAGUE & CO. 483 EAST HADLEY STREET FLETCHER LANE E.C.

FIRST PREMIATED DESIGN FOR DURHAM COUNTY COUNCIL BUILDINGS.—MESSRS. COOKSEY & COX, ARCHITECTS.







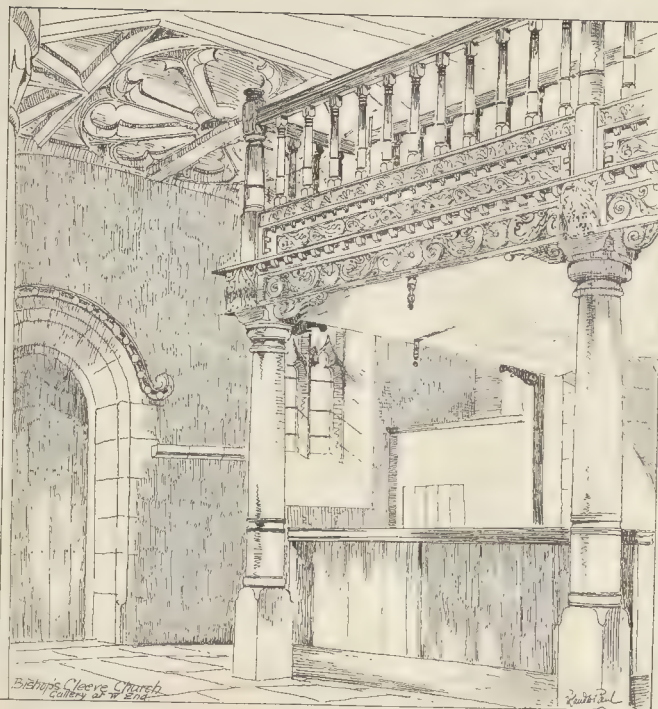
ve Church Tomb in St. Francis



Flagstaff Ch



Canterbury - Fields Gate



Bishop's Cleeve Church
Gallery of St. Mary

W. H. R. L.



Canterbury Abbey.
The 'Abbey House'

W. H. R. L.

universally made hitherto between the swimming-baths for men and women should be abandoned, all events for the "first-class" baths. Among the upper classes swimming is as much taught to girls as to boys now, and any observer at a seaside watering-place will probably find that among the bathers some, at least, of the ladies will be among the best swimmers present; and there is no reason why they should be denied the long swimming-bath which is considered essential for the men. In regard to one point of detail referred to by the author, we think that the gangway in front of the dressing-boxes should be given preference to a fall towards the boxes, and the small gutter required to drain it placed close up to the boxes, as it is not in the way there; rather going in or out of the box would naturally pass across it; whereas if the fall is the other way the gutter next the outer edge of the gangway it is in the way of bathers "taking off" from the gangway.* The subject of roofing and lighting the swimming-bath should not have been referred to without a caution as to the necessity of giving attention to absolute security of any glass used for roof-glazing; such glass ought to be fixed so that even if a sheet gets loose there is no possibility of its falling into the bath; a most distressing and fatal accident occurred from this cause some years ago in a swimming-bath.

The author gives a lucid description of the various systems on which the warming of the water in a swimming-bath may be and has been carried out, grouping them under four heads: the ordinary circumstances no doubt the system of steam-injectors combined with circulation is the most efficient, but we are strongly inclined to think that the simple system which the author calls "No. 1," the addition of fresh hot water, has possibilities of producing better results than any other, if we suppose a liberal use of water and arrangement for its ingress at numerous points all round the bath; or, still better, at the bottom. Of course then the question of water-rate becomes serious; but at least fresh water would be continually brought in, and if properly arranged the distribution of warmth might be as complete as with the injectors. As the latter (the most recent) system really is "patchiness" in the water? There is room for a little more complete evidence on that point. At all events, every system which involves circulation, and the return of the same water to the bath, has in itself an inherent vice, and nothing is so sheer necessity for economising water can justify it. Imagine how different swimming-baths would be if they were served with a continuous fresh supply of water warmed to the necessary point, with a continuous escape of that which was cooling, instead of circulating and bringing back the same water. But we must not wait for our new London water-supply to accomplish that improvement.

A little suggestion is made about the architectural treatment of a swimming-bath, which the author seems to regard as rather a hopeless task. The dressing-boxes and other surroundings no doubt often treated in a very commonplace way of joiner's work; this might easily be improved without much additional expenditure. Really, a swimming-bath affords a great deal of architectural suggestiveness, and might be made a beautiful interior; but as swimming-baths are usually built out of rates, of course money is generally allowed for this. In some of the most costly baths which have been erected the open timber roofs are a mistake, architecturally; they make the upper portion of the bath dark and give dark reflections. A swimming-bath looks much more attractive when there is a bright surface above it to give brightness to the water. A flat coffered ceiling with lights, or a semicircular ceiling, or a set of domed compartments, are much more suitable and give a more attractive appearance than a heavy-looking timber roof.

Artistes Célèbres: Polykleitos. Par PIERRE LARIS. Paris: Librairie de l'Art.

PARIS's book is an interesting résumé of what is known about Polykleitos and his work. The author endeavours, of course, to establish by a comparison and consideration which of the existing copies or reproductions of the *Doryphoros* and *Doryphoros* may be accepted as probably nearest to a representation of the original work; a kind of disquisition which leads to have endless attractions for students of art and archaeology, but which never seems to get

would be quite possible, and much easier, to make a model behind the main supports of the dressing-box, and underneath the grated wooden floor which always is provided in them. We do not know whether this has ever been thought of.

out of the region of fancy into that of fact, and probably never can. M. Paris sums up with the conclusion that Polykleitos (who, he points out, was recognised by contemporary Greek opinion as the superior of Pheidias) was a sculptor who had not the great ideas and the bold conception of Pheidias, but had within his own limits attained to greater perfection. He attributes to him the now well-known base-relief on the most complete sculptured drum of the Ephesus columns, regarding the figure of Hermes there as allied to the school of Polykleitos, and observing that he was contemporary with Scopas, who is known to have carved one of the Ephesus columns, and that the Ephesians would not have associated any but an eminent sculptor with Scopas. On such bases are conclusions of this kind built. It would appear to us that nothing could well be further apart than the dreamy languor of the Ephesus Hermes and the manly simplicity of the reproductions of the Diadumenes. But for the discussion of these and other points we refer the reader to M. Paris's pages.

Figure-Drawing and Composition: Being a Number of Hints for the Student and Designer upon the Treatment of the Human Figure. By RICHARD G. HATTON. London: Chapman & Hall. 1895.

THIS is a very useful small book for beginners (and more especially) for those who require to have a general knowledge of the figure for architectural and decorative accessories. It does not go minutely into the subject of anatomy, but gives sketches and memoranda of the main points to be considered in representing the figure. The small outline-sketches of the figure in different positions and in different circumstances of composition, are well done, though in a slight manner, and indicate very well the points, for instance, which differentiate the male and female figure in general proportion and design, and the lines assumed by the figure in various attitudes.

In the concluding chapter on "Composition," the subject is well summed up and illustrated in a short space. The distinction between the decorative method of composition in the Louis XIV. and Louis XV. styles, on page 285, is very well put, as also the remarks on the different effect of long-distance and short-distance perspective, in scenes occupied with figures. The distinction expressed between pictorial and ornamental art, the former "displaying facts of life and experience," the latter "seeking first to make life beautiful," is perfectly correct, though, as the author adds, the two naturally cross and overlap. The book is throughout well written, and suggests a great deal in a few words.

The Architectural Design of Harrow Church, Derived from a Study of the Building. By SAMUEL GARDNER. Harrow: J. C. Wilbee. 1895.

THIS is a handsomely got-up book, with many illustrations, and, as far as form is concerned, is a worthy monograph on the building with which it deals. It is expanded from a paper prepared on the occasion of a visit of the Clapton Architectural Club to Harrow in 1893, and is published, we gather, partly with the excellent view of interesting Harrow pupils in the church. The author does credit in his preface to the learning and ability displayed in the article on Harrow Church in the *Builder*, of January 26, 1895, which has induced him to reopen one or two of his chapters, after completion, in order to discuss points in which he did not agree with us. We need not reopen the discussion here; we think the article in our columns was the result of as long and careful study of the building as that of Mr. Gardner, with possibly more definite architectural and constructive knowledge. Mr. Gardner honestly gives our arguments in footnotes, and those who have studied the church can form their own opinion as to the probability of our views or those of the author. As a monograph, the book is a complete and creditable one, and we are glad to see it, and hope it will be bought by many parents of Harrow boys, as an encouragement to take interest in the history and architecture of their church.

Pocket-Book Calculations in Stresses, Etc., for Engineers, Architects, and General Use. By E. MONSON GEORGE, M.Inst.C.E. London: E. & F. N. Spon; New York: Spon & Chamberlain; Calcutta: Thacker, Spink, & Co. 1895.

THIS is a real "pocket-book," small enough to be carried about, and giving the principal formulæ

and calculations bearing on constructive problems, in good type and with many diagrams. Young architects should put it in their pockets and study it in the train and at other convenient spare moments.

The Pocket Technical Guide, Measurer, and Estimator for Builders and Surveyors. By A. C. BEATON. Seventh Edition. London: Crosby, Lockwood, & Co. 1895.

THIS is a still smaller pocket-book than the last, intended mainly as a guide and reminder to contractors as to what they should look out for in reading specifications, and what they should take account of in estimating. Its chief use would be to beginners in a builder's business.

The Student's Column.

METALS USED IN BUILDING.—VII.

ALUMINIUM.

ALUMINIUM has never been found in a metallic state in Nature; nevertheless it is one of the most widespread elements, and in the form of silicate of alumina is found in all clays, felspars, and a variety of other minerals. Regarded in a broad sense it is one of the most useful metals or metallic compounds employed in the building industries. Even if we exclude the various earths constituting the basis of bricks, terra-cotta, stoneware, &c., because they were described in detail in the last series of articles in our "Student's Column," we still find that aluminium and its compounds enter into a great number of building materials, or are used by the builder for divers purposes.

The principal ores of aluminium are:—

1. *Cryolite*, fluoride of sodium, and fluoride of aluminium (aluminium, sodium, and fluorine) with about 13 per cent. of aluminium.
2. *Bauxite*, alum clay, hydrated alumina, with silica and iron, having alumina from 46 to 58 per cent.
3. *Corundum*, pure alumina, viz., aluminium = 53.4, oxygen = 46.6 per cent.

Cryolite is a red or brownish mineral, semi-transparent, especially when dipped in water. It is rather brittle, and is usually found massive but in thin laminae. The ore comes almost exclusively from one spot in Greenland, viz., Evgitok in Arktut Fjord. Before 1860 only small quantities of this cryolite were raised, but soon after that date the deposit was systematically worked, and the mineral was exported to a considerable amount. The mine, or quarry, may be described as a hole in the ground, of elliptical shape, about 500 ft. in length and 170 ft. in width. The ore has been exploited to the depth of about 120 ft., and drills have penetrated another 120 ft., proving the persistence of the ore to at least that depth. The mine is close to the water's edge. The ore occurs in a large vein running through gneiss, associated with galena, zinc blende, cassiterite, fluor spar, &c., and these are most abundant near the margins of the vein. The cryolite becomes darker as it is worked into, being, in fact, almost black in some parts. The special uses of the mineral will be given presently.

Bauxite is so named from the village of Baux, near Arles, in France. As this ore is likely to assume tremendous importance in the near future, if, indeed, it has not done so already, we may consider it at some length. The mineral was first found and exploited at the French locality mentioned, though, from the circumstance of its being highly ferriferous, it was then worked as an ore of iron. The real character of the material and its remarkable properties were revealed by Berthier. Its mode of occurrence was subsequently studied by M. H. Coquand, who describes the mineral as of three varieties—psilolite, compact, and earthy. The psilolite variety does not differ in structure from the iron ore of Franche Comté and Berry, although the colour and composition are different. It occurs in highly-inclined beds alternating with limestones, sandstones, and clays of Upper Cretaceous age; also as pockets or cavities in the limestone. The latter near the bauxite is psilolite, and the ore is occasionally compacted by calcareous cement. Other localities in France yielding this ore have been admirably described by M. Angé.

In reference to German bauxite, Dr. Lang

* "Bull. Société Géologique de France," tome xxviii. (1871), p. 98.

† "Bull. Société Géologique de France," tome xvi. (1888), p. 345.

remarks* that in Ober Hessen it is found as round masses in the fields, and embedded in clay coloured with iron oxide. Its composition varies widely. Examination with the microscope shows that it is principally derived from the decomposition of basalt.

By the weathering of the plagioclase feldspars in that rock, as well as the augite and olivine, nearly all the silica has been removed, together with the greater part of the lime and magnesia; the iron has been oxidised, and hydrate of alumina formed. In a more recent dissertation, Herr A. Liebreich says † that the best known localities of bauxite in Germany are the southern slope of the Westerwald, near Mühlbach, Hadamar, in the neighbourhood of Lesser Steinheim, near Hanau, and especially the western slope of the Vogelsberg. An examination of micro-sections of bauxite from the last-mentioned locality shows that the majority of the specimens possess the structure peculiar to basalt, though, of course, in a greatly decomposed condition. On the other hand, in other places this structure seems to have broken up, the mineral being laid down, in a sedimentary form, as clay.

Turning to the occurrence of bauxite in our own country, we may say that it is only raised in Antrim, at the village of Straid, near Ballyclare and neighbourhood. The mineral was discovered in Antrim about the year 1870 and prior to that date English manufacturers obtained their bauxite entirely from French and German sources. The following diagram (fig. 5), shows its mode of occurrence in that county:—



FIG. 5.—Section showing mode of occurrence of Bauxite, near Ballyclare, co. Antrim.

a=Basalt. b=Pisolitic iron ore. c=Pavement iron ore. d=Lignite. e=Bauxite. f=Bole.

From this it will be noticed that the upper part of the section is occupied by an irregular sheet of igneous rock—basalt—(a); whilst a bed of bole (yellowish red clay), is found at the base (f). Between these, on the right-hand side of the section, a deposit of pisolitic iron ore (b), above another iron ore disposed in a tabular manner (c) occurs. On the left-hand side is a bed of lignite (d), under which is the bauxite (e). Referring to this section, Mr. C. H. Williams remarks ‡ that on its being traced up in the field, the iron ore bed gives way to the bauxite in nearly all cases. Like the pisolitic ore with which it is so intimately associated, it is found next the upper basalt (there being a lower bed of that rock some depth under the bole), unless it happens to be overlaid by the lignite, which is not a very persistent bed. There is a gradual diminution in size and number of the pebbles in the iron ore bed, and they finally disappear as the bauxite clay is approached. Lithomarge (yellowish red clay, differing from bole, amongst other things, in that it is infusible before the blow-pipe, whilst bole fuses easily to a yellow or green enamel) always maintains its regularity below the bole and bauxite.

The eagerness for the possession of bauxite has led to its discovery in recent years in several parts of the United States, especially in Georgia, Alabama, and Arkansas, the only States in which it occurs in sufficient quantity to be of economic value. The Georgia and Alabama deposits are found irregularly distributed within a narrow belt of country about sixty miles in length. No igneous rocks are found in its vicinity, nor are there any others that could yield bauxite as a residual deposit by weathering. To account for its origin, the suggestion has been made that the material came up to the surface in solution through the medium of hot springs (the former existence of which in the district may be inferred on good grounds), and then precipitated. The Arkansas bauxite, on the other hand, occurs as regularly stratified beds, found only near the contact of the

material with certain igneous rocks with which their origin seems to be closely connected.

Turning now to the last-mentioned ore of aluminium, viz., corundum, we may say that it is found in a crystalline form (hexagonal), as well as massive and granular. Its colour is very variable; incidentally it may be remarked that when pure, transparent, and of good colour the red variety constitutes ruby, and the blue sapphire. Crystals of corundum found in alluvial deposits are generally very much waterworn. Emery is a black or greyish-black variety of corundum. From a chemical point of view corundum and emery are easily distinguished from each other in that the former is oxide of aluminium, whilst the latter contains oxide of iron also. Corundum is by far the more valuable mineral, being harder (9) and of greater durability. Boulders of emery embedded in a ferruginous soil, and sometimes in statuary marble, are found in several islands of the Grecian Archipelago, in Asia Minor, the Urals, and three or four localities in the United Kingdom, viz.: Cornwall, Cumberland, and the Mourne Mountains, Ireland. In the United States both corundum and emery occur in North Carolina. The former is found in pockets and veins usually 4 ft. to 12 ft. in width, chiefly in gneiss and schistose rocks, but also in connexion with olivine and serpentine. Crystals have been found weighing as much as 375 pounds. The mineral is frequently wrapped in layers of various other compounds containing alumina and magnesia, outside of which there may

be another envelope, of corundum. Near Franklin, in the same State, emery is mined in a more or less "pocket" condition. It consists, at the surface, chiefly of hard emery rock, which continues to a depth of 8 ft. to 10 ft., and then thins out to a thin seam of flint. In the emery veins are found masses of red clay, carrying manganese-stained sand-corundum, into which the hard emery rock seems to merge at a slight depth. The emery, as exploited, is a mixture of rather fine-grained to medium-coarse corundum and magnetite, often associated with chlorite, hematite, quartz, mica, garnet, and pyrites. Sand-corundum consists of white or grey corundum crystals, about a quarter of an inch in diameter, embedded in a matrix of decomposed chlorite and red clay.

Another ore, not yet mentioned, is *aluminite*, which contains from 20 to 30 per cent. of alumina in a condition to be cheaply purified; the reason we have not given prominence to it is because it has not hitherto been exploited for commercial purposes. It has been found in such abundance within the past two or three years in the Western States of America, however, that it will no doubt be extensively used in the near future, when convenient carriage has been introduced.

And now as to the properties and uses of these aluminium ores. In the first place, we may say that cryolite and bauxite are extensively employed in the production of the metal aluminium. Although this metal was discovered by Wöhler as long ago as 1828, it has only within the last few years been able to be obtained successfully on the large scale, owing to improvements in the metallurgy of aluminous earths. It is a white, malleable metal, about as hard as zinc, and it fuses at a slightly lower temperature than does silver. We have stated that it occurs largely in a combined form in common clay. From this the student might, at first sight, imagine that such clay is suitable for producing the metal, but that is not the case—at any rate so far as the metallurgy of the subject reaches at the present time. Pure kaolin, or china clay, contains, on an average, about 39 per cent. alumina, carrying about 20 per cent. of aluminium, with 40 per cent. silica, and

14 per cent. of water.* Now, as silica is much easier to reduce than alumina by all methods of reduction thus far used for the manufacture of aluminium, this large percentage of silica must be separated from the alumina before the actual reduction is commenced, else a large percentage of the energy and of chemicals used in the reduction, will be expended in reducing a troublesome impurity, instead of reducing the alumina to aluminium. The value of clay, therefore, as an ore of aluminium is not apparent in comparison with richer and purer hydrated oxides of aluminium, having only accidental quantities of iron and silica, which have to be removed before being submitted to the reducing operation. The variability of the chemical composition of these "purer" forms may be gathered from the following analyses:—

Chemical Composition of French, German, and American Bauxite.

	French.		Ger- man.	American.	
	I.	II.	III.	IV.	V.
Silica ..	7.30	2.20	1.10	2.80	6.11
Alumina ..	69.30	76.90	90.92	92.21	55.89
Iron oxide ..	12.90	1.0	15.70	13.50	19.45
Titanic acid ..	3.40	4.00	3.20	3.50	—
Water ..	14.10	15.80	28.60	17.72	17.39
Magnesia ..	—	—	16	—	—

- I.—Red bauxite from Thoronet, Var.
- II.—White bauxite from Villeveyrac, Hérault.
- III.—From Vogelsberg (probably the variety Gibbsite).
- IV.—Dark-coloured bauxite from Floyd Co., Georgia.
- V.—Black bauxite from Saline Co., Arkansas.
- VI.—Red bauxite " " "

Chemical Composition of Irish Bauxite, Antrim.

	First Quality.	Second Quality.	Third Quality.
Alumina ..	51.83	52.00	46.13
Peroxide of iron ..	4.57	4.57	15.14
Lime ..	6.13	—	—
Magnesia ..	13	20	26
Potash ..	0.1	0.2	0.4
Soda ..	—	6.6	2.1
Lime ..	8.67	13.00	10.40
Titanic acid ..	5.80	6.20	4.20
Sulphuric acid ..	0.7	0.7	1.0
Phosphoric acid ..	trace	trace	trace
Combined water ..	29.97	24.00	21.39

(Analyses by Pattinson, of Newcastle-on-Tyne.)

Comparing the Irish ores with the others, we note that each of them contains a higher percentage of silica than any French, German, or American sample. On the other hand, the proportion of alumina in the first and second quality Irish compares favourably with the German and two American; whilst both the Antrim ores lastly alluded to, contain much less iron than any other sample quoted, save that from Hérault—very important matter. The red bauxite from Thoronet has more iron than is usually met with in these clays, and does not seem to be a specially good kind for the production of aluminium, though it contains a very high percentage (69.30) of alumina. The French samples, in fact, seem to be best characterised by the enormous quantities of alumina contained in them, and the variety from Hérault appears to be especially good. The further uses to which aluminium ores are put will be described in the next article.

OBITUARY.

MR. R. M. HUNT.—We regret to record the death of Mr. Richard Morris Hunt, the well-known American architect, which occurred on the 31st ult. Mr. Hunt was born in Brattleborough, State of Vermont, in 1828, and was the son of the late Hon. Jonathan Hunt, Member of Congress. In 1843, at the age of 15, he accompanied his family to Europe, and entered a school at Geneva, commencing the study of architecture with Samuel Darier. From Geneva he went to Paris, and studied under Hector Lefuel, entering the Ecole des Beaux-Arts in 1845. On leaving the Ecole he travelled through Europe, Asia Minor, and Egypt, and on his return to Paris in 1854 he received from the French Government the appointment of "Inspecteur aux Travaux" on the new buildings uniting the Tuilleries to the Louvre. His master, Lefuel, having during his absence succeeded Visconti as architect, he was put in charge of the Pavillon de la Bibliothèque, opposite the Palais Royal, and made, under Lefuel

* Cf. "Mineral Resources of the United States for 1892," p. 236.

* "Berichte der Deutschen Chemischen Gesellschaft," Bd. xvii. (1884), p. 2, 592.
† "Chemisches Centralblatt," 1892, No. 3, p. 94.
‡ "Trans. Manchester Geol. Soc." Vol. xxii. (1894), p. 521.

all the studies and full-size drawings of that Pavilion. In 1855 he returned to America and spent about six months in assisting the late Thomas U. Walter at the Capitol of Washington. He then, at New York, commenced the practice of his profession. Shortly afterwards he took an active and a prominent part in founding the American Institute of Architects. He succeeded R. M. Upjohn and Thomas U. Walter as President, and subsequently was elected President of the Institute under its re-organised constitution. He was also for several years President of the New York Chapter of the American Institute. Soon after commencing his career in New York, Mr. Hunt opened an architectural atelier for students on the French system. In 1867 Mr. Hunt served as a member of the Fine Arts Jury at the International Exposition in Paris; in 1876 he held the same office at the Centennial Exhibition in Philadelphia; and in 1893 he served as a member of the Fine Arts Jury of Selection, and as President of the Board of Architects at the World's Columbian Exposition at Chicago. In 1882 Mr. Hunt received from the French Government the decoration of the Legion of Honour, and was elected a Corresponding Member of the Institut de France in the following year. He was also an Honorary Member of the Société Centrale des Architectes Français, and of the Architects and Engineers Society of Vienna; and an Academician of St. Luke at Rome. Harvard University conferred on him the degree of LL.D. Mr. Hunt was an Honorary Corresponding Member of the Institute of Architects, and in 1893 he received on that body the Royal Gold Medal. In our issue of June 24, 1893, in the representation of the medal will be found further particulars of Mr. Hunt's career, as well as a portrait of the deceased gentleman.

GENERAL BUILDING NEWS.

CHOIR-STALLS, PORLOCK PARISH CHURCH, DORSET.—In the parish church of Porlock, Dorset, which was restored in 1892, under the supervision of the late Mr. Sedding, new choir-stalls have just been erected. They are of oak, worked from the drawings of Mr. Sedding. In the front of the stalls are panels carved in various devices. The ends of the stalls are similarly treated, but each with different foliage.

NEW SANATORIUM, CARDIFF.—On the 8th inst., the new Cardiff Sanatorium was opened. The site (twelve acres in extent, on the Canton Moors, near the western boundary of the borough) contains the administrative block, two main wards, two isolation blocks, laundry block, stable, disking house, and mortuary. The administrative block is three stories in height, the rest being one or two floors. There are three staircases, the main staircase in the centre, which is at the back of the building adjoining the kitchen. On the first floor there is a nurses' sitting-room and ten bedrooms, and on the second floor nine bedrooms; bath-rooms, lavatories, &c., are also provided on the first and second floors of the administrative block. The wards are erected on the pavilion principle; there are two large wards, each main block of four bays, and two small wards for special cases, each 12 ft. by 12 ft. and 12 ft. high, the total number of beds thus provided 104. Between the wards in each block is a nurses' kitchen and duty room, with a view of each main ward looking into the ward. At the end of each main ward is the water-closet, sinks, and bath-room, cut off from the building by a tiled lobby; and adjoining each of the main wards is a veranda with French casement windows. The main wards are a waiting-room, and also a room with two dressing-rooms for discharging patients. The isolation block is divided into two main parts by a wall, and the arrangements on one side of the wall are an exact counterpart of those on the other. Each of the larger isolation wards is 23 ft. by 15 ft., and the smaller wards 14 ft. by 14 ft., all 12 ft. high, providing in all accommodation for six beds. Between the wards will be the nurses' duty-room, with inspection windows as in main wards, and adjoining will be bathrooms and a space for movable baths. In addition to the isolation provided by the walls, windows, bit-and-miss tilating grids are fixed immediately above the level, and Tobin's inlet tubes about 6 ft. high, tilating trunks are fixed in the ceilings connected with Shorland's extract ventilators on the ridge for carrying off the vitiated air. The wards, besides being heated by steam, are also provided with Shorland's patent Manchester stoves and grates. The nurses' rooms, bath-rooms, &c., have no sharp angles. Owing to the exceptionally low level of the site the whole of the floors have been kept above the ground level, and the floors and main stairs of the wards are carried on piers and arches. The floors of the wards are constructed of cement concrete carried on steel joists and finished with oak planks, whilst the floors of the verandas, water-closets, and bath-rooms are similarly constructed, finished with marble mosaic. The whole of the floors are connected with the administrative block by means of covered corridors. The laundry block contains a washhouse and finishing-room, drying-

closet, engine-house, boiler-house, and coal-stores. The chimney is 70 ft. high, and adjoining it is an incinerator for the purpose of destroying bedding, bandages, poultices, and other seriously infected articles. In the disinfecting house are two compartments, the one for infected clothing and the other for disinfected articles, and in the division-wall is built one of Washington Lyons' patent steam disinfectors. The mortuary is at the extreme south-east end of the site. The buildings are faced with Ruabon buff bricks above the plinth level, relieved by red bands and Forest of Dean stone-dressings, the rubble masonry under the plinth being built in blue Pennant stone, whilst the roofs are covered with Bangor slates, capped with red-ridge tiles. Space is reserved for five more main ward blocks and one isolation block, which will provide accommodation for 116 additional patients. The contractors for the work were Messrs. Turner & Sons, of Cardiff, and the cost of the buildings and furniture will amount to about 40,000*l.*, exclusive of the cost of the land. The laundry machinery, boilers, kitchen appliances, &c., have been supplied by Messrs. Bradford & Co., Salford, who have also carried out the steam-heating of the wards. The buildings were designed by the Borough Engineer, Mr. W. Harpur.

INFIRMARY, ISLEWORTH.—The new Infirmary at Isleworth for the Brentford Union is nearing completion. The building is three stories high, and consists of four pavilions of three wards in each pavilion. It has been erected from the designs and under the superintendence of Mr. W. H. Ward, architect, of Birmingham. Mr. T. J. Messom, of Twickenham, is the builder. The wards are warmed and ventilated by means of Messrs. E. H. Shorland's patent ventilating Manchester stoves, with descending smoke flues.

TECHNICAL SCHOOLS AND GYMNASIUM, WINSFORD, CHESHIRE.—The Verdin Technical Schools and Gymnasium was opened at Winsford by the Duke and Duchess of Westminster on the 8th inst. The schools comprise class and preparation rooms, a chemical laboratory, an art store-room, plumbing-room, cookery-room, laundry drying and ironing rooms, and committal- and cloak-rooms. Messrs. Woodhouse & Willoughby, of Manchester, are the architects. In the centre of the block is the main entrance, surmounted by a large Flemish scroll gable and flanked on either side by subordinate gables, each with a chimney-stack springing from the apex, and connected by the ridge of the roofing with the main gable. Two subordinate doorways, similar in character and treatment to the principal entrance, provide direct communication—one with the boys' section of the schools and the other with the girls' department, while the front entrance leads directly through an ante-room to the gymnasium. Mullioned and transomed windows light the three principal elevations. The front of the building and the sides are faced with Ruabon red stock bricks, and all the dressings are in red terra-cotta. Internally, the joiner's work is generally of St. John's pine. The gymnasium measures 49 ft. 6 in. by 37 ft. 6 in., and is 30 ft. high from floor to ceiling. The cost of the building, including the furnishing, amounts to about 8,000*l.*

CONDITION OF WINCHESTER CATHEDRAL.—The condition of the roof of the nave of Winchester Cathedral is causing, says the *British Times*, much anxiety. It is estimated that to carry out the work as it ought to be done an expenditure of some 5,000*l.* or 6,000*l.* will have to be faced. As long ago as 1873 the late Mr. Ewan Christian reported that the roof of the nave was "to a great extent in a very bad state," and that from the tower up to within 60 ft. of the western end, where it had been renewed, it was in a disorganised state. It was Mr. Christian's opinion that this was, without doubt, the original roof of William of Wykeham's work, and, though it was well and powerfully framed in respect of timber, it was then in a very weak condition. It was, he thought, impossible to say how long such a roof might stand, but it had been seriously weakened by the cutting of the timbers, and, being then without any inherent strength of its own, it had become a dead load on the walls. The whole of the lead, Mr. Christian complained, was also in a bad condition. Little, however, has been done since this report was presented. At the end of 1893 Mr. J. B. Colson, architect to the Dean and Chapter, presented a long report, in which he said that an absolute renewal of the lead was necessary on one-half of the north, and on the whole of the south, side of the roof. But more important than the state of the lead was the fact that most of the tie-beams, consisting of a series of trussed rafters, were in a seriously defective and disorganised state. The matter was still allowed to remain in abeyance, until two or three weeks ago, when Mr. Colson wrote that it was again his duty to call attention to the nave roof. "The time has arrived," he wrote, "when something must be done to the leads, even if the timbers are allowed to remain in their present condition. On the south side, where subsidences have taken place, three places to the extent of 12 ft. 6 in., 16 ft. 6 in., and 17 ft. 6 in. wide respectively, and on the north one place 6 ft. wide, the whole length, from gutter to gutter, require relaying; and I unhesitatingly say that unless this receives immediate attention there is

danger of the whole slipping, perhaps forcing the parapet, and falling on to the lower roofs, with an effect to the timber and vaulting that must, at least, be disastrous and expensive to remedy. Slipping, recasting, and relaying the lead would cost, he estimated, at least 200*l.*, and if the repairs of a permanent nature which he advised were carried out on the roof in the near future, the amount spent on the leads would be almost entirely thrown away.

SCHOOLS, SHORT HEATH, STAFFORD.—On the 14th inst. the Bishop of Shrewsbury opened the new infant room in connexion with the Church Schools at Short Heath. The new infant room will accommodate eighty infants, and may also be used as a parish room. Mr. M. Johnson, of Wolverhampton, has acted as architect, and Messrs. Gordon & Swann were the builders.

BOARD SCHOOLS, BLYTH, NORTHUMBERLAND.—On Tuesday the new "Forster" Board Schools, built by the Cowpen (U.D.) School Board, were opened. The schools are built on a site half an acre in extent, in Hambleton-street, on a portion of the Thornton Croft estate. They are two stories in height, and consist on the ground floor of an infants' department, and on the first floor of a mixed elementary school, with a total accommodation for 650 children. The playgrounds are throughout covered with asphalt, finished with Derbyshire spar. The exterior walls of the building are of red brick-work, with red terra cotta strings and dressings to gables, doorways, &c. The contract, amounting to about 4,000*l.*, has been carried out by Messrs. H. Brown & Co., of Newcastle-on-Tyne, from the designs of Mr. J. H. Morton, of South Shields.

RESTORATION OF SMAILHOLM CHURCH, ROXBURGH.—The Presbytery of Edinboro and the heritors of Smailholm have approved of plans for the improvement of the Parish Church. The plans, prepared by Messrs. Hardy and Wight, architects, Edinburgh, embrace, in their entirety, the complete restoration of the building, but at present these cannot be fully carried out. With the exception of the restoration of the chancel arch and gable for the nave, the expenditure will be limited to providing for the better accommodation of the worshippers. The work to be now done includes a new roof and floor, new seating, the addition of a north transept and vestry, and new ventilating and heating apparatus.

SCHOOL, AIRDRIE, LANARKSHIRE.—On the 13th inst. the new secondary school, which has been erected by the Airdrie School Board as a higher department of Airdrie Academy, was opened. The new building is situated on the lands of Mavisbank. The main building is a block measuring 85 ft. long and 59 ft. wide, and is of two stories in height. There are separate entrances for boys and girls. The elementary education accommodation is confined to the ground floor, while the science and art department is to be accommodated on the upper floor, and will consist of a chemical laboratory, balance-room, instrument-room, mechanical drawing room, and cast-room, while provision is made in detached buildings for the teaching of cookery, laundry-work, and for modelling. Provost Aitken was the architect of the building.

SCHOOLS, BILL QUAY, DURHAM.—The foundation-stone of the new Wesleyan schools and vestries at Bill Quay have just been laid. The cost of the new buildings will be about 1,700*l.* The architect of the new premises is Mr. J. W. Taylor, of Newcastle.

SANITARY AND ENGINEERING NEWS.

DRAINAGE SCHEMES NEAR GOOLE.—We are informed that Mr. E. C. B. Tudor, C.E., of West House, Goole, has prepared a scheme of drainage for Rawcliffe, for the Goole Rural District Council, which is approved by the Local Government Board, and the Council are making application for the money. Mr. Tudor has also another scheme in hand for the Goole District Council, for the village of Swinefleet, together with other drainage and sanitary improvements to private residences upon which he has been consulted.

ELECTRIC LIGHT WORKS, SALFORD.—The electric light works of the Salford Corporation, situated in Walnes-rd, Lower Broughton, were opened on the 14th inst. Messrs. Kincaid, Waller, & Manville, of Westminster, were the electrical engineers who devised the scheme. The high-pressure alternating system has been adopted, by which the current is supplied at a pressure of 3,000 volts, through concentric copper cables, insulated with special impregnated fibrous compound, laid in cast-iron pipes. The pressure is reduced by transformers at consumers' premises to about 100 volts. There are three sets of engines and dynamos at the generating-station, each set capable of supplying 2,500 8-candle power lamps alight at one time, or to 2,800 lamps connected to the mains, it being found that only about 60 per cent. of the lamps connected are alight at the same time. As it is necessary to keep one of the sets of plant in reserve, the producing power of the station is equal to supplying 8,300 8-candle power lamps, connected to the mains. The cables have been constructed to supply 17,000 8-candle power lamps. The buildings were erected by Mr. Samuel Warburton for the sum of 6,600*l.* There are three sets of slow-speed horizontal compound condensing-engines of 200 nominal horse-power each, working

at 160 lbs. pressure, and running at eighty-five revolutions per minute. These were supplied by Messrs. Browett, Lindley, & Co., of Patricroft, at a cost of 4,309*l*. The engines drive the alternator dynamos by means of cotton ropes. The dynamos and exciters were supplied by Messrs. Mather & Platt, Ltd., of Salford, and are driven at the rate of 500 revolutions per minute. Messrs. Mather & Platt also supplied the switch-board and electrical instruments, the total amount of their contract being 3,150*l*.

WATERWORKS, PORTSOY, BANFF.—The formal opening of the new waterworks for a second supply of water to the burgh of Portsoy took place recently. The new reservoir is built of concrete, and is 100 ft. long by 20 ft. wide and 7 ft. deep, inside measurement, and will contain 80,000 gallons. The new supply is collected in gathering-pipes, and yields twenty gallons per minute. A 5-in. iron pipe conveys the water to the town from the reservoir. This new supply just doubles the available supply to the town. The architect is Mr. McWilliam, Portsoy; the contractor, Mr. Beveridge, Culter; and the inspector of works, Mr. Cameron, Elgin.

FOREIGN AND COLONIAL.

FRANCE.—At the Hôtel de Ville, Paris, there is an exhibition of competition designs for the Monument à l'Asnière; more than fifty architects have taken part in the competition. The jury of the competition opened at Dijon have awarded the first premium to MM. Auban and Godefroy, of Dijon; the second premium to MM. Brey and Rochefitte, also of Dijon; and the third premium to M. Constant Bernard, of Paris. The selected design consists of a large basement surrounded by balustrades reached by a staircase of six steps on each face. On this is a pedestal adorned with figures, symbolising Honour, Duty, Justice, and Science. Above this is the pedestal, decorated with the Gallic cock, with wings outspread, amid various symbols and inscriptions. The whole is surmounted by the bronze statue of Carnot, with a figure of Fame at his feet. Another monument to Carnot is to be shortly erected at Nolay, his native town. On a pedestal of white veined marble, ornamented with symbols of Justice and War, is the figure of a child holding a cartouche of red marble with an inscription; above this is a pedestal decorated with laurels, carrying a group which represents Carnot dying, supported by a figure representing France. M. Falguère has been commissioned to complete this monument, which was commenced by the late sculptor, Rouleau. Another monument to Carnot, to be erected on one of the public places at Bordeaux, is to be carried out by M. Ernest Barrias.

On Sunday last, at Remiremont, a monument was inaugurated in honour of French soldiers killed during the war of 1870. M. Gaudier is the sculptor.

A statue of Joan of Arc, executed by the Duchesse d'Uzès, has been inaugurated at Pont à Mousson.

A competition has been opened for the construction of a Hôtel de Ville at Montdidier.

A bridge is to be constructed over the Rhone, between Barbantane and Aramon, carried partly on stone piers, but with a central suspension bay of 280 metres in length. Two lines of electric railway are shortly to be constructed in the higher Pyrenees, both starting from Perrière—the one to Raillière, near Canters, the other to St. Sauveur.

The death is announced, at the age of sixty-six, of M. Ancelet, a pupil of Baltard, who obtained the Prix de Rome in 1851. He had been elected Member of the Institut in 1892, in place of the late M. Bailly. Among his works may be mentioned the Château de Pau, one wing of the Château of Biarritz, the Salle de Spectacle at St. Château de Compiègne, and the Vaucanson gallery at the "Conservatoire des Arts et Métiers" at Paris.

GERMANY.—The foundation-stone of the national monument at Berlin will be laid by the Emperor on the 18th inst. The German national memorial of the Battle of Leipzig (1813) will be erected near the battlefield, to the south-east of the city. An extensive site has been purchased, and a competition has now been opened for the design. 40,000*l*. are at the disposal of the committee, who have, however, only reserved 250*l*. for premiums to the competitors.

Of the many Bismarck monuments in course of erection throughout Germany, the Bismarck Tower at Göttingen is now nearing its completion. The tower, which has been built on a prominent hill, is 65 ft. high. The material used is stone, and the architect is Herr Gerber. The first sculptor engaged on the Martin Luther monument for Berlin, Professor Otto, died some time back. His place was taken by Herr Töberentz, who has also now died. The monument is, however, practically ready, and was unveiled last month, so that a third sculptor will not have to be employed. The monument is in the form of a statue of Luther on a high granite pedestal, surrounded by Melancthon and other prominent figures of his time. Professor Otto's commission was the result of a competition in 1878. The popularity of exhibitions seems to continue in Germany, if we look through the list of those open this summer and the number planned for 1896 and 1897. Of larger exhibitions open at present we would mention one at Koenigsberg, known as the North-East Prussian Industrial Exhibition; another at Strasburg for Alsace indus-

tries; a third at Lubeck, known as the "North German Commercial Exhibition"; and a fourth provincial one at Posen. Though the site reserved for next year's Industrial Exhibition at Berlin was unusually large compared with the ground taken up by international exhibitions in other countries, the area has not been found sufficient, and another 60,000 square metres has been leased. Messrs. Siemens & Halske's electric railway to the exhibition grounds has now been taken in hand. Most of the tramways running in the direction of the exhibition will be rearranged as electric tram-cars. Various systems will be employed, and a Government committee will examine the merits of the different systems. The completion of the new house for the Prussian Diet is promised by the end of next year. This building will be the first of the proposed group consisting of the homes of the Prussian Diet, the Prussian Upper House, and the Prussian Ministerial Offices. The buildings will have a mutual electric light station, and a central system of heating and ventilation.

The new addition to the General Post Office in Berlin is now well hand. The new building will be the interesting Post Office Museum in the new wing, and there will be a large covered court for the principal exhibits of this collection. We would mention that the museum includes plaster models and plans of every post office in the empire. Most of the new structures are carried out in brick in what is called the "Hanoverian" style. They are generally very perfectly planned, as the Postmaster-General has made a specialty of his buildings, and allows his Board of Works a very liberal outlay. The old Opera House at Berlin is now in the hands of the builders. The front of the house is to be altered, and there will be a new stage. The Royal Opera Company have selected the new building, which has been materially altered for this purpose. Unfortunately this building is most unsuitable for the performances, and both the staff and the audience are subject to much discomfort. Berlin is to have a new Botanical Garden, which will serve the same purposes as our Kew Gardens. Dr. Gueke, the head of the German Botanical Institute, has been sent to Kew Gardens in order to prepare plans for his new conservatories on similar lines to ours. The chief of the Prussian Government Board of Works, Herr "Ober Baudirektor" Spieker, will shortly retire. This office is the most important position open to the permanent Government building officials.

MISCELLANEOUS.

JOURNALISTIC ENTERPRISE.—To create an imaginary circulation for an architectural journal by sending out thousands of copies of it gratis on a special day, and simultaneously blowing trumpets about the enormous circulation attained, is an ingenious though not perhaps a very moral device, and may impose on the simple-minded. But it acquires a ludicrous side when the bundles of addressed wrappers, prepared in advance for the execution of the project, are inadvertently delivered, in the first instance, at the office of the wrong journal.

THE PRESIDENT OF THE PRUSSIAN ROYAL ACADEMY.—The new session of the Prussian Royal Academy will open under the presidency of an architect. Professor Ende, of the firm of Messrs. Ende & Beekmann, of Berlin, has been elected to take the President's chair in place of Professor Professor Becker, who held office since 1882, and lately resigned. Professor Ende, who held the Vice-President's chair for years, is the second architect who has taken office. Professor Friederich Hitzig (1876) was the architect who preceded him. Professor Ende, who is the recognised leader of the German profession, not only practically holds every position of importance open to architects who are not permanent building officials, but at the same time is a most popular figure with the general public and the art circles of the Continent. Besides carrying on a very large practice as a private architect, and being responsible for numerous public buildings, he holds office in the "Akademie für Bauwesen," and is consulting Architect to the various Ministries and public authorities. He holds professorships at the Royal Technical College and the Royal Academy, and masterhips in various other institutions. It would perhaps be well to note that Professor Ende is one of those rare figures who never appears to be short of time, especially for his juniors and foreigners. Among his most important works we would notice the Japanese Houses of Parliament and Government Offices, which have been illustrated in the *Builder*. It is curious for English eyes to find the new President, Herr Ende, acting jointly with his partner, Herr Beekmann, as builders and contractors, but this is by no means unusual for architects of standing abroad in whom clients have full confidence.

SANITARY INSPECTORS AT HUDDERSFIELD.—The Yorkshire Branch of the Sanitary Inspectors' Association held a general meeting at Huddersfield on the 3rd inst. The inspectors first visited the Hiltown refuse destructor, and returning to Huddersfield were entertained to lunch in the Mayor's reception-room at the Town Hall, by the Health and Sanitary Committees of the Corporation. The members were afterwards conveyed by a special tram-car to the borough sewage outfall and purification works at Deighton. These works, with the

land, have cost about 100,000*l*. Mr. R. S. Dugdale, C.E., the Borough Engineer, acted as guide, and described the works in detail. Having returned to the Town Hall, the members heard an address from Mr. R. W. Cass, Surveyor and Inspector of Puddon on "Some Important Details in Drainage and Sewerage." Mr. T. Pridgin Teale, of Leeds, President of the branch, presided. Mr. Cass described chiefly with defects noticeable in house drains, pointed out where many of the arrangements were at fault, and laid a heavy hand on the too-forgotten scamped work of the jerry builder. By a series of diagrams, photographs, and models, he illustrated the manner in which dwellings often became insanitary, and how such serious evils might be overcome. The Chairman moved a vote of thanks to the Mayor of Huddersfield for the cordial character of his welcome. Referring to the subject which had been laid before them, he said that a great deal had been done in late years, and a great deal had been done tentatively. They were bit by bit feeling their ground, and though they were right in the end, they were not sure that they could improve upon it. The motion was seconded and adopted, and the Mayor replied.

BUILDING OPERATIONS IN THE UNITED STATES.—Everything, says the *American Architect*, points to a great increase in building operations in the near future all over the country. In New York, which is the most important market, the building trade has proved general conditions, the amount of building already enormous. The number of permits for the erection of new buildings during the past six months is almost exactly twice as great as the number issued during the corresponding part of 1894, and the proportion between the intended cost of the work for the two periods follows nearly the same ratio. Meanwhile, the number of permits for alterations has not very much increased, showing that the hesitating season of alterations, which usually precedes a time of confident and extensive building, is nearly over, and that New York, at least, is entering on a new era of development. How soon the two periods followed by other cities remain to be seen; but nothing is more certain than that the prosperity of one part of the country means the prosperity of all, and local conditions can only in slight degree delay or modify the change which building interests have for the last few years looked on and hoped for.

RUTTY'S ROAD-SCARIFIERS.—Messrs. A. & L. Rutty, contractors, of Bromley-by-Bow, have again secured the order from Her Majesty's Commissioners of Works to break up the whole of the main road in Hyde Park and the other Royal Parks with the improved scarifiers, which will be working on the jobs daily till the end of September.

SANITARY INSPECTORS' ASSOCIATION.—The Sanitary Inspectors' Association (Liverpool centre) visited Darwen, where they were received by the Mayor. They were then conveyed to the Turton Moor Fireworks Works, where the appliances and manufactures were explained, and the party afterwards revisited the Bull Hill Infectious Disease Hospital, and inspected several patterns of water closets, &c., which had been specially fixed. The party afterwards inspected several firework works in the neighbourhood, next journeying to Oakenburg and inspecting the new main sewage works of Darwen Corporation, which have been put down by the Corporation at a cost of 30,000*l*. in consequence of the action of the Ribbleside Joint Committee. The works were explained by Mr. W. Stubbs, A.M. Inst. C.E.

CHICAGO EXHIBITION, 1893.—The President of the United States has issued, under the authority of a special Act of Congress, a complimentary diploma to the Commissioners of the countries which took part in the Chicago Exhibition of 1893. The representatives of Great Britain who have received the diploma, which acknowledge "the grateful appreciation of the Government and people of the United States of America for their valued participation in the Exhibition, are Sir Richard Webster and Mr. Henry Trueman Wood, the Chairman and Secretary of the Royal Commission. The diploma bears the Seal of the United States, and is signed by Mr. Grover Cleveland, the President, and by Mr. M. Gresham, Secretary of State.

PERTH BUILDERS' ANNUAL EXCURSION.—On the 7th inst. the Perth builders had their twenty-fifth annual Summer trip. The trip this year consisted of a drive to Crierf via Methven and back by Methven and Auchtermuchty. Crierf was reached about half-past twelve o'clock, and a little later dinner was served in the Commercial Hotel. Mr. A. Beveridge, the President of the Association, occupied the chair. Various toasts having been given, the Councillor Wood gave "The Town and Trade of Perth." Mr. J. Macfarlane, with whose name the toast was coupled, said that never in his experience had he seen anything like the present activity in building trade. He had known it for thirty-seven years, and in that period wages had exactly doubled. That showed that all classes of tradesmen and working men must be prospering. O. her toasts followed.

NEW WINDOW, GREENHEAD.—A new window, by Messrs. Stephen Adam & Co., of Glasgow, has just been inserted in Greenhead Parish Church, which is at present in course of renovation. The window, which is a memorial one to Mr. and Mrs. Tullis, consists of three lights, divided into

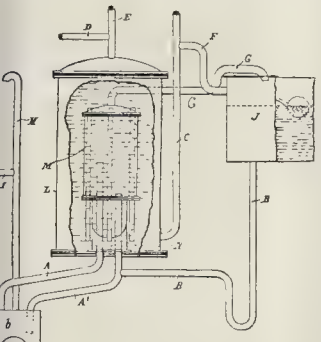
ctions; the Nativity of Christ being recorded in the lower panels, while Christ in glory, with worshipping angels, is represented in the upper panels. Blues and greens predominate in the upper portion, while deeper blues, purple, amber, and gold are employed in the lower panels.

LONDON AND PROVINCIAL BUILDERS' FOREMEN'S ASSOCIATION.—This Association intend holding their second Annual Dinner to-day (Saturday), at "Ye Olde Four Swans Hostellerie," Valtham Holy Cross. The chair will be taken by Mr. W. Edden, the President.

SCIENTIFIC AND TECHNOLOGICAL LITERATURE.—Messrs. Chapman & Hall have been constituted sole agents in this country, the Continent, and the Colonies, for the sale of the important scientific and technological publications of Messrs. Wiley & Sons, New York, one of the first scientific publishing houses of the world.

PARTNERSHIP.—Mr. Jasper J. Kelf, of Waltham-street, has taken in partnership Mr. Arthur Fullings, who has recently been assistant to Mr. Fred, Chancellor, F.R.I.B.A. The business will in future be carried on under the style of Kelf & Fullings.

CLAY'S "SAFETY" HOT-WATER SYSTEM.—The accompanying diagram illustrates this ingenious system, which is worth attention. It is intended to supersede all necessity for special safety-valves by separating the circulating pipes carried through the house from any direct connexion with the boiler, and providing for the direct escape of steam as soon as the water reaches boiling-point. The boiler is supplied by the small regulating cistern, and the heated water circulates between the boiler and the cylinder, and as the inner cylinder is provided with a safety-pipe G, having an open end, the water can only obtain 212 deg.; this being so, the water in the inner cylinder can only give off 212 deg. of heat to the water contained in the outer cylinder, and supplied on the store cistern. The water from the store cistern to the outer cylinder does not enter the



Section of Clay's "Safety" Hot-water Supply System

boiler; there are two separate and distinct bodies of water. The water in the boiler can only be heated to a definite and known number of degrees, which depends solely on the height of the small supply tank above the boiler. The safety-pipe H, in the boiler flue, being open to the atmosphere, gives off heat received from boiler, when the water within reaches the boiling-point, in exactly the same manner as the spout of an ordinary kettle. The safety-pipe H being very short, and in the boiler, can never fail to give relief to the boiler at all times. The regulating cistern and inner cylinder contain from six to twelve days' supply for the winter, in case of prolonged frost; and if the supply water fails from any cause, the boiler cannot, under any circumstances, explode, even when suddenly charged with water. The only result would be a temporary stoppage of the hot water supply. The patentee is Mr. Henry Clay, hot water engineer and plumber, of Liverpool.

GROSVENOR HOSPITAL FOR WOMEN AND CHILDREN.—The tender of Mr. T. J. Messom, of Twickenham, has been selected for the Session 1894-5, for the out-patients' department. The interior, part, or main portion, will follow next year, drawings now being in course of preparation. Messrs. Roumieu & Aitchison are the honorary architects to the hospital buildings.

UNIVERSITY COLLEGE, LONDON.—The following medals and prizes in connexion with architectural studies have been conferred during the Session 1894-5:—Fine Art; Donaldson Medal.—V. A. Flower (London). Prize; A. M. Watson (London). Third Class; A. S. R. Ley (Brackley).—Construction; Donaldson Medal.—A. T. Coode (London). Prize; J. S. Heath (Blackheath). Certificates; J. M. Snell (Bromley). 4. A. E. (London). Second Class; J. S. Moore (Brackley). Third Class; J. M. R. Alves (Brazil). J. Freeman (Blackheath). H. T. Naison (Bedford).—Classes maintained by the Carpenters' Company. Architectural Drawing: First Prize,

H. L. Bunn (London). Second Prize, L. Cabuche (London). Third Prize, G. Jacob (London).—Construction Drawing. Prize, O. J. Potter (London).—Measuring and Quantities. First Prize, F. Stacey (London). Second Prizes, 29. S. Green (London), S. Porter (London). Third Class, F. B. Chester (London). Sidney Ebbs (London). E. A. V. Garnham (London). A. S. Seaman (London).

CARDIFF FREE LIBRARY.—This library is to be fitted with wrought-iron electric light fittings by Messrs. Braun & Co. of Birmingham.

BUILDING REGULATIONS, ROCHEDALE.—At a meeting of the Rochdale building committee held on the 2nd inst., the proposed new building regulations for the borough were again submitted for consideration. An informal discussion followed, and in the course of this it was pointed out that the most important points awaiting settlement are contained in the regulations as to the thickness of the external walls of dwelling-houses, the making-up of footpaths running between the backs of cottages built in rows, and the height to which front walls should be carried in the case of dwellings provided with attic bedrooms. Originally the committee proposed to stipulate that the external walls of houses should be at least 16 in. thick—instead of 9 in. thick, as required by the by-laws now in operation—but at the last meeting it was evidently taken for granted that the Town Council would not approve of this change. Consequently, though no motion was submitted in relation to the matter, it was generally agreed that the committee should not insist upon the proposed stipulation being adopted, but should leave the old by-laws as to thickness of walls unaltered. As to the footpaths between rows of cottages, it was understood that the owners of the cottages should be required to make up the paths. Respecting the height to which front walls should be carried there was considerable difference of opinion, and no definite understanding could be arrived at. Eventually, without any resolution being formally adopted, the whole matter was adjourned for further discussion at the next meeting of the committee. —*Rochdale Observer.*

LEGAL.

AN IMPROPERLY-CONSTRUCTED STAIRCASE.

AT the North London Police-court, on the 9th inst., the case of Meeson v. Shurmur was heard before Mr. Paul Taylor. This was a case in which the defendant, in the erection of the Millfields-road Board School, had constructed a staircase of wood, and had formed the entrance-doors so that only two-thirds of their width opened out, the clear width of each doorway, which could be considered available for exit in case of panic, being only 2 ft. 2 in.

The District Surveyor, Mr. F. Meeson, had disapproved of this construction, and had, under Section 45 of the 1893 Act, served a notice of irregularity. This notice not having been complied with, he issued a summons under Section 46.

Counsel for the defendant, Mr. C. Glen, took a preliminary objection that the magistrate had no jurisdiction, quoting the case of the Queen v. Caruthers.

The magistrate, after perusing the case, decided that he had no jurisdiction. Summons dismissed.

CAPITAL AND LABOUR.

CONSOLIDATING BUILDING FEDERATIONS.—At the invitation of the London Building Trades Federation, a preliminary conference has been held at the Operative Bricklayers' Hall, Southwark Bridge-road, for the purpose of consolidating the various Building Federations throughout the country. The business resolved itself into the consideration of suggested rules for the National Federation, which were ultimately agreed to by the delegates, and ordered to be sent to the various federations throughout the country for their ratification. By means of this National Federation, over 70,000 organised building workers will join hands in defence of trade interests.

FEDERATION OF BUILDING TRADES IN SCOTLAND.—At a meeting of twenty-three members of the Scottish Building Trades Federation, on the 13th inst., at 5, St. Andrew-square, Edinburgh, a constitution and rules were formally adopted, and officers were elected. The objects of the Federation, which is composed of employers only, are (1) to encourage, by friendly conference and otherwise, the maintenance of cordial relations between employers and operatives in the building trades, and the satisfactory adjustment of all differences arising from time to time; (2) to secure united action in dealing with demands made by workmen in reference to wages, hours of labour, piece-work, overtime, employment of non-union men, apprentices, use of machinery, and generally all restrictive conditions sought to be imposed upon the building trades; (3) to assist, as far as practicable, local associations in time of strikes and on other fitting occasions by such means as may be considered desirable; (4) to secure the recognition by architects, measurers, and others, of a fair and reasonable form of contract between contractors, and their co-tenants, and to further the adoption, in

the building trades, of suitable rules for measuring work, and the adjustment of contractors' accounts; and (5) to establish branches of the Federation in towns and districts throughout Scotland, and render them suitable advice and assistance as required. Mr. David Heron, Edinburgh, was elected President for the current year, and Mr. John Adam, Glasgow, and Mr. J. B. Hay, Dundee, vice-presidents. An executive of twenty-one members was also appointed. The meeting was representative of the leading towns in Scotland.

MEETINGS.

SATURDAY, AUGUST 17 TO AUGUST 24.

Institution of Junior Engineers.—Belgian Summer Meeting, Antwerp, Ghent, Brussels, Liège, and Verviers. London Members leave Liverpool—street Station at 7 15 p.m., Friday, the 16th inst.; from North of England via March to Harwich.

WEDNESDAY, AUGUST 21.

Build-ers Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

FRIDAY AND SATURDAY, AUGUST 23 AND 24.

Association of Municipal and County Engineers.—Meeting in Londonderry.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

19,947.—DOOR KNOBS AND SPINDLES: J. J. Sumner.—The screw in the neck of the knob is dispensed with. In this case the neck is formed with a projecting rim or flange on its extreme end, a semicircular collar or washer is cut to fit on the neck, and screws passing through the rose of the handle also fix the handle by entering the collar or washer.

14,168.—LEVELLING INSTRUMENT: J. W. Shepherd.—Several modifications of the instrument are introduced for the purpose of measuring angles, gradients, and distances. Sights, a vernier needle, and a carefully-marked circle are placed above a base-board, whereon a compass, level, and graduated circle is also marked.

14,027.—SLIDING AND HINGED SASHES: H. A. Dawson.—A pointed and hooked bolt, with a spiral engaging spring, is the principal fastening, arranged so as to draw the doors or window-sashes together and prevent rattling.

15,123.—CHIMNEY POT AND VENTILATOR: W. Peyton.—This improvement has reference to a former patent, 6,545-91, and combines with trumpet-mouthed openings another series of openings near the top of the central flue, to increase the draught.

18,210.—COMPOSITION FOR ROADS, PAVEMENTS, AND FLOORS: G. S. Cory.—With asphalt or cement in a plastic state, indiarubber waste cut into very small pieces is mixed, and the whole pressed into blocks.

18,806.—FLUSHING CISTERNS: C. H. Kitching.—To obtain a better flush the valve-way and siphon connexion is made in the form of a breeches piece, and a full way is obtained, so that when the handle is pulled an instantaneous flush is effected, and the siphon acts at once, no abrupt turns impeding its progress.

14,438.—TILES: J. T. Kohler.—The shape of the tiles, the ridges, and edges are made with a view to fitting, so that, although close expansion and contraction is allowed for, a special projection forms a weather-proof joint, preventing access of water between the meeting-ridges of the tiles.

11,131.—WATER-CLOSETS AND VALVES: W. and N. T. Thomson.—The arrangement of self-sealing valves, supply, and outlet are all modified and proportioned so as to secure a sluice, and to prevent the possibility of sewer-gas entering through the cistern. Several mechanical diagrams are given, and actions described.

NEW APPLICATIONS FOR LETTERS PATENT.

JULY 29.—14,351, R. Taylor, jun., and L. Dunkerley, jun., Machines for Sharpening Saws.—14,365, F. Henke, Artificial Stone.—14,398, T. Morton, Combined Mechanism for Adjustable Openings for Ventilators, Gratings, &c.

JULY 30.—14,428, D. Butterfield, Door Check.—14,430, W. Franklin, Water-closets.—14,442, E. Von Leitner and H. Gouter, Building Sets.—14,653, D. Simpson, Revolving Window Frame.—14,654, C. Kinszett, Testing and Infecting Drains.—14,679, L. Clement, Non-slipping Kentish Ragstone and Bitumen Road-paving and Flooring.

JULY 31.—14,538, F. Borland and R. Gould, Chimney-pot or Cowl and Down-draught Preventer and Ventilator.—14,567, J. Whelan, Controlling the Admission of Water to Cisterns or Tanks.

AUGUST 1.—14,619, W. Craft and F. Mash, Stained Glass.—14,621, O. Lauch, Facing or Covering of Walls.—14,634, E. Eliot, Indicating Device for Doors and Gates.

AUGUST 2.—14,069, J. Hardy, Valve Arrangement for Siphons used in Cisterns.—14,660, W. Broughton, Stands for supporting Theodolites, Levels, &c.—14,664, F. Bernard, Connexions for Earthenware Water-closets, Urinals, &c.—14,678, E. Fraser, Gratings for Floors, Footways, &c.—14,726, P. Varilla, Mechanical and Electrical Apparatus for Excavating and Removing Earth.

AUGUST 3.—14,716, J. Hay, Wash-out Water-closet.—14,739, F. Buckland, Arching Knobs or Handles of Door-fastenings.—14,744, S. Timings, Swing Joints or Pivots for Windows, Ventilators, &c.—14,752, T. Shillito, Fixing Mouldings to the Walls of Buildings.—14,763, E. & G. Francis, Safety Device for Windows.—14,790, P. Stuart, Blocks for Paving, Flooring, Landings, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

12,572.—J. Morris, Silent Spring-Hinge.—13,108 W. Tunks and J. Burn, Door-Chains.—13,276, H. Vaughan, Hanging and Fastening Window Sashes.—13,371, A. Anderson, Bakers' Ovens.—13,730, E. Aske & C. Terry, Chimney or Ventilator-Hoods or Cows.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

17,747, F. Oliver, Paint.—17,797, J. Kennedy, Window-fastener.—17,995, C. Field, Ventilators and Chimney-tops.—12,064, E. de la Saucie, Metal Window-frames.—12,866, E. Phillips, Monumental Stones, Grave-stones, Monuments, &c.

[illegible]

TENDERS.
(Communications for insertion under this heading should be addressed to "The Editor," and must reach us *later than 10 a.m. on Thursdays.*)

ABERDEEN.—Accepted for the erection of a shop, Methlick, Mr. Grant. Mr. W. Clark, architect, Methlick, Aberdeen.
Accepted.

ABERDEEN.—Accepted for the erection of a house and outhouse, Badenoch, Rothie Norman, for Mr. John Henderson, Wm. Clark, architect, Methlick.
Accepted.

BARNET.—For the supply of gun tons of Lancashire, or other size, for the South Minnis Rural District Council, Mr. Greenway, engineer of Highways, Tottenham Bar.
Accepted.

BERWICK-ON-TWEED.—For relaying a portion of Bridgeway with wood-paving, for the Sanitary Authority, Mr. Dickinson, Borough Surveyor, Berwick.
Accepted.

BRADFORD (Yorks).—For the construction of brick-ware and reed-works, for Messrs. Dobson, Roper, & Margreaves, Messrs. F. Woodhead & Son, surveyors, 15, Exchange, Bradford.
Accepted.

BRADFORD (Yorks).—For the erection of two houses, Moor ark View, Kipling-road, for Mr. William J. Pugh, engineer, Messrs. Lister & Sons, architects, Bradford.
Accepted.

BRICKTOWN (Herts).—For alterations and additions to existing house, Messrs. Pugh & Anderson, architects, High Street, Watford.
Accepted.

BRIDGEND (Glams).—For laying, &c., cast-iron water-pipes, &c., for the Bridgend Waterworks, Mr. Jesse Gardner, engineer, 12, Bridgend-road, Tendu.
Accepted.

BRISTOL.—Accepted for the execution of public street improvement works, for the St. George Urban District Council, Mr. T. Lewis, Surveyor, Parish Office, St. George, Bristol.
Accepted.

CARDIFF.—For forming, &c., Red Layer-street and others, for the Corporation, Mr. W. Harnett, C.E., Borough Engineer, Town Hall, Cardiff.
Accepted.

CARDIFF.—For rebuilding Wesley Chapel, Charles-street, Cardiff, for the Trustees, Messrs. J. P. Jones, Richards, & Henry, Pugh, architects, St. Mary-street, Cardiff.
Accepted.

CHARLBERY (Dorset).—For additions, &c., to Finstock and Fowler School, Mr. Geo. Castle, architect, Woodstock.
Accepted.

CHELMSFORD.—For the erection of shop, &c., Moulsham-street, for Mr. J. D. Crampton, Mr. F. Whitmore, architect, 1, Duke-street, Chelmsford.
Accepted.

CLAYTON-LE-MOORS.—Accepted for the erection of paving & sewerage works, Mulsford, for the Urban District Council, Mr. A. Dodgson, surveyor, Clayton-le-Moors.
Accepted.

CRAYDON.—For the erection of a pair of villa residences at Wellington, Craydon, for Mr. F. Gohard, Mr. Robert M. Chert, architects, 1, Union Bank Chambers, Craydon.
Accepted.

CULMINGTON.—For the erection of farmhouse and premises on Whiteheadfield Harrow, Culmington, Devon, for Sir W. W. Karslake, J.C. Messrs. E. Ellis & Son, surveyors, Exeter.
Accepted.

DEVONPORT.—For alterations to No. 7, Fore-street, for the Devonport Conservative Club Company, Mr. Henry Geo. Luff, architect, 61, Chapel-street, Devonport.
Accepted.

DONCASTER.—Accepted for the erection of six houses and shop, French-cage, for the Corporation of Doncaster, Mr. Crabtree, Borough Surveyor, 3, Priory-place, Doncaster.
Accepted.

DURHAM.—For the execution of sewerage works, Ludworth, for the Rural District Council, Mr. Geo. Gregson, surveyor, 38, Sadler-street, Durham.
Accepted.

ENFIELD.—For pulling down, rebuilding, and siting up the "Gaiety" public-house, Market-place, Enfield Town, for Messrs. Savill Bros., Ltd., Mr. Fred A. Ashton, architect, 3, Crooked-lane, E.C.
Accepted.

ENFIELD.—Accepted for the erection of a house, South Fraddon Hill, Millers, for Mrs. M. M. Farnham, Buckle, seat, Fyvie, Mr. W. Clark, architect, Methlick, Aberdeen.
Accepted.

HALIFAX.—Accepted for additions to "Oddfellows' Hall," for the Society of Oddfellows, Manchester Unity, Messrs. Hornsall & Sons, architects, Lord-street, Halifax.
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HARWICH.—For the erection of schools, playgrounds, and closets, &c., on the Bathside, for the Harwich School Board, Messrs. W. W. Sturt, architect, Colchester, Clacton-on-Sea, and Harwich.
Accepted.

HASTINGS.—For the supply and delivery of 98 tons cast-iron pipes, &c., for the Corporation, Mr. F. H. Palmer, C.E., Town Hall, Hastings.
Accepted.

HEREFORD.—Accepted for the erection of three houses in Westfield-street, on the Ryeland Estate, Mr. Ernest G. Davies, architect, 6, St. James, Hereford.
Accepted.

IDLE (Yorks).—Accepted for the erection of "Brooke's Memorial Vestry" at Holy Trinity Church, Messrs. J. Kendall & J. H. Bakes, architects, Calverley Chambers, Victoria-square, Leeds.
Accepted.

KIRTON-IN-LINDSEY (Lincs).—For the erection of school buildings, for the School Board, Mr. Wm. Waugh, architect, Gileston, Lincoln.
Accepted.

KNOTTINGHAM (Yorks).—For taking down existing premises and erecting two semi-detached residences in Bridge-street, for Mr. Charles Langford, Mr. Ernest G. Davies, architect, St. John-street, Hereford.
Accepted.

LEOMINSTER.—For the erection of school buildings, Burgess-street, and other alterations, for the Trustees of the Wesleyan Chapel, Mr. E. G. Davies, architect, 6, John-street, Hereford.
Accepted.

LEYTON (Essex).—For making-up, &c., several streets, for the Urban District Council, Mr. W. Dawson, C.E., Town Hall, Leyton.
Accepted.

LONDON.—For the erection of a chimney shaft, 120 ft. in height, for the Shoreditch Vestry, Messrs. Kincaid, Waller, & Manville, engineers, 29, Great George-street, Westminster, S.W.
Accepted.

LONDON.—Accepted for the erection of three villa residences in the Darnley Park Hill and Magdalen-roads, at Highgate, Messrs. Ker & Holkley.
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The Builder.

VOL. LXIX. NO. 2742.

August 24, 1895.

ILLUSTRATIONS.

Architectural Association Excursion.—Sketches on the Line of Route, by Mr. S. K. Greenslade, A.R.I.B.A. :—

Two Bays of Nave, Gloucester Cathedral.....	Single-Page Ink-Photo.
The Reliquary, North Transept, Gloucester Cathedral.....	Single-Page Ink-Photo.
Tewkesbury Abbey from the South-East.....	Single-Page Ink-Photo.
Entrance Front from Churchyard, Chastleton.....	Single-Page Ink-Photo.
St. John's Church, Gloucester; House, Charlton Abbots; The Manor Farm, Southam, and Part of Entrance Front and Lodge, Stanway.....	Double-Page Ink Photo.
The Jacobite House and Church, Winchcombe; St. Nicholas, Westgate, Gloucester; The Tower at the Cross, Gloucester; and a House, Gloucester.....	Double-Page Ink-Photo.
A House at Tewkesbury; Church and Manor House, Buckland; and a House at Broadway.....	Double-Page Ink-Photo.

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Plan, Llaneston Priory.....	Page 137	Crest Stone in Lewannick Church.....	" 138
Font in St. Stephen's Church, Llaneston.....	" 137	Diagram illustrating "Student's Column" article.....	" 140

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The Paris Sanitary Exhibition, 1895.



THE law which has recently been passed necessitates that the whole of the house drainage of Paris shall be rearranged, within the next three years, to bring it into conformity with the system which exists in England, and it has naturally called a great deal of attention to sanitary matters. It is not, therefore, surprising that an International Exhibition of Sanitary Appliances should have been inaugurated as a preliminary step in this desirable direction. The exhibition has been opened since the first day of June in the Palais des Arts Libéraux in the Champ de Mars, one of the buildings erected for the last Paris Exhibition. Owing to its being incomplete in some of its details, we have refrained from reporting upon it until now. The exhibition will remain open until September 15. Engineers, architects, and manufacturers have been specially invited to take part in the exhibition, and an appeal has been addressed to Englishmen interested in sanitation, though the reply, represented by the number of English exhibitors, cannot be called encouraging. There are ten classes in the exhibition, representing the hygiene of dwelling-houses, municipal hygiene, prevention of infections, demography and sanitary statistics, sanitary science, hygiene applied to infancy, industrial and professional sanitation, alimentary hygiene, hygienic clothing and physical exercises.

Amongst the English Committee of Patrons appear the names of Sir Douglas Galton, Sir Robert Rawlinson, Professor W. H. Corfield, Sir Henry W. Acland, Sir Philip Magnus, Messrs. Shirley J. Murphy, and A. R. Binnie, of the County Council; and Messrs. J. Wright Clarke and Reynolds.

It is a matter of some regret that the headings, or subdivisions, which are quoted above, should not have governed the arrangement of the exhibits. These, however, seem to have been arranged in a

somewhat haphazard manner. Consecutive interest and means of comparison are absent, and some of the interest is wanting which would otherwise have been present. The exhibition may be considered an interesting one, though, from an English point of view, it is a matter of some surprise that so few representative firms have contributed to it.

M. H. Mouret, engineer, of Paris, exhibits some charming specimens of opaline laminée, or porcelain, invented by him, in the shape of bricks and slabs for wall-linings; this material, which is of a very even colour and high glaze, has been apparently extensively used in lavatory tops, table and counter tops, and other similar purposes, for which it is admirably suited. The decorative qualities of this material are equally good, and some of the painted plaques are charming. It claims to be especially useful in bath-rooms, lavatories, water-closets, operation-rooms, laundries, kitchens, milk, butchers', and tripe shops, and the long list of hospitals, railway-stations, and other buildings in which it has been used, shows that it is a material which merits the popularity which it enjoys. In an adjoining stand, Messrs. Piet & Co., of Paris, exhibit many examples of lavatory and water-closet apparatus, in which the opaline laminée above referred to is utilised in an effective way. Their exhibits of needle and shower-baths are also interesting. Their water-closet pans in earthenware, some with vertical sides and a nozzle for the water discharge at the back, which has no rim to distribute its discharge, are certainly new to us. The use of a polished brass supply-pipe from the water waste-preventer to the pan is an improvement which might be more usually adopted. Messrs. Piet & Co.'s fittings for large and small laundries are also excellent. The Compagnie de Salubrité de Levallois-Perret, Rue Victor Hugo, exhibits its apparatus for treating draining adopted by the town of Levallois-Perret, which partly consists of removing obstructions before putting the drainage into a pipe of small diameter. There are some good specimens of stoves for disinfection on an adjoining stand, exhibited by M. F. Dehaitre, of Paris; these

seem to have been used in well-known institutions. The linen is enclosed in a galvanised wire cage, which runs into a cylinder with heavy iron doors at each end, a system of valves then completes the work, the position of the cylinder being at the division-wall between the two rooms, so that the disinfected clothes are removed from the cylinder in a different room free from infection. The exhibition contains many photographs of actual disinfecting chambers in use by municipalities around Paris, which clearly show these machines in use. The stall of M. J. Croppi, of Paris, contains some good specimens of sanitary apparatus, consisting of earthenware lavatory and water-closet basins of English origin, of which the fittings have been procured in Paris. Most noticeable amongst these is a very neat appliance in the form of an attachment to the supply-pipe to the water closet-pan; a small bottle of creoline is so placed that the rush of water of each pull releases a quantity of disinfectant to accompany each discharge. M. Croppi also exhibits a lifting mahogany seat with an ingenious double-hinged lid, which provides a smaller seat suitable for a child's dimensions. M. H. de Montricher is one of several engineers who has exhibited plans of projected urban and other drainage. The particulars of filter installations and water supply to public and private buildings exhibited by M. G. Carré are very complete, and demonstrate the various applications of his system, such as placing a filter at the side of a sink, a filter in a kitchen or office, a large filter placed in the basement with the water taken direct; another alternative is a filter placed in the basement with the water in separate services for drinking and washing purposes; a filter installation in basement with elevating reservoir assuring a pressure of filtered water on upper floors. Another plan shows a filter or reservoir, where the pressure is nil or insufficient, the filtered water being forced to a higher level by a pump. Some illustrations are also shown of an installation made at l'Hôpital International, Peau. Specimens of lavatory basins have been exhibited by Messrs. Jones & Campbell of Larbert. At

an adjoining stand the Nadien Compound Syphon Company, of Harrow, is represented. This syphon is a series of six lead pipes of graduated sizes and lengths, bent to form syphons, the ends of the six pipes being brought into one discharge pipe; as a consequence these six pipes acting at the same moment are likely to give a very powerful discharge, useful in all kinds of cisterns, but especially so for urinals; though an absence of a sufficient water supply prevented us applying a practical test at the time of our inspection. Messrs. Claughton Bros., of Bramley, near Leeds, exhibit some good specimens of lead pipes, traps, and other plumbers' fittings, of sound workmanship and material. M. Victor François, of Paris, shows a button arrangement for emptying a flushing cistern attached to a water-closet, instead of a cumbersome pull or plug. The action of the syphon is induced by pressing a button, which immediately liberates the air contained in the bell covering the syphon in the flushing-cistern, and induces the action of the syphon. This arrangement appears to be a good one, and reduces the exertion to a minimum. The iron and lead traps of M. François are also good of their kind. The Patent Gully Company, of Nottingham, also show their road-gully, with its double trap and means of cleaning same.

M. Henry Coppin, of the Rue St. Lazare, also exhibits his system of fans, or bellows, applied to forges. This system could be admirably adapted to a smoke-testing apparatus for drains. Cremation is represented in the Exhibition by the Société de Crémation, who send an excellent collection of photographs of their crematorium and columbarium, and, with a view to accentuating their usefulness, particulars are given of the putrefaction of bodies in different stages. M. G. Guyon, architect, submits the designs for a group of workmen's dwellings constructed in 1892-93. MM. Cauthey, Hausmann, & Co., of Paris, have on view some models of an arrangement for ventilating rooms by means of double sheets of glass and a space between to give an upward tendency to the inlet current. Messrs. Howatson & Co., of Neuilly, have on view particulars of the system of purification and filtration of drainage water which has been adopted in a large number of English towns.


The goods on view of the Société des Produits Céramiques et Réfractaires de Boulogne-sur-Mer are of excellent quality, and are mostly water-closets and glazed sinks of good material. An innovation, in the shape of a lifting seat to a pedestal water-closet, is shown by omitting the front portion, which is most liable to be soiled, and is practically useless. Amongst the few English firms who are represented in this exhibition, Messrs. Oates & Green, of Halifax, are to be found with a show of large-sized drain-pipes, glazed sinks, and other materials for which they are justly noted. The well-known firms which comprise the Leeds Fireclay Company are represented by a good show of porcelain baths, puro and Titan closets, porcelain sinks and lavatories, glazed bricks, Hall's hanging tiles, Gregory's locking tiles, and Shepwood's bricks. As such well-known firms as Messrs. Cliff & Sons, Brooke & Sons, the Burmantoft Company, Ingham & Sons, and the Wortley Fireclay Company are incorporated in the above company, it is needless to say that the goods exhibited are of high quality. Portable buildings constructed with a wooden frame and two layers of canvas are shown by the Société des Constructions Hygiéniques. These are suitable for hot countries, and are ventilated in the roof. The Société des Crèches de Paris supply interesting particulars of their work and their buildings, with photographs and plans. Their work appears to be growing in Paris.

Ventilating tubes, with draft induced by water-jet, are exhibited by M. L. Bessière; these are almost identical with the Æolus Waterspray Ventilator, which is fairly familiar to all. The amount of water used appears

to be the obstacle to general adoption, but this may be rectified by the more general adoption of water-meters. An interesting specimen of English plumber's work comes from the Shoreditch Municipal Technical School; it is a simple arrangement of soil and ventilating pipes with trap for water-closet, and was executed by Messrs. C. H. Quelch and A. W. Walter, registered plumbers; we are glad to notice it. Another interesting exhibit is provided by the Union des Femmes de France, which has shown a tent fully equipped with all medical necessities for supplying aid to the wounded on the field of battle.


We are obliged to own to a feeling of disappointment in the exhibition as an international one, especially as regards sanitary fittings in which we do not consider that the French can be compared to our best manufacturers. Many of the latter are conspicuous by their absence, and all sections of the exhibition are not well represented by exhibitors. We have, however, been much struck by the particulars supplied by many French municipalities as to their means of carrying out their drainage, water-supply and other duties, and foremost amongst these is the exhibit of the Ville de Paris, showing by means of models, plans, and illustrations, the course and development of their drainage, the origin and course of the Parisian water-supply, the means adopted for veterinary sanitation, disinfection and preservation of bodies in the Morgue, and, last, but not least, the cleaning and watering of their streets, in which London is very far behind Paris in every respect.

A NEW GRANITE.

HE granites of Newry, in Ireland, are well-known in the market. Their pleasing blue-grey tints and fine grain have placed them high in the estimation of large granite users, especially for ashlar and polished work. A new variety of the stone has recently been put on the market which fully sustains the excellent character generally borne by the Newry stones. It is known as "Altaveigh dark granite," and may be briefly described as follows:—The colour of the stone in the rough is dark grey; when fine-axed it becomes lighter in tint, as do all highly crystalline grey building stones. On being polished it assumes a deep blue tint, and bears a close resemblance to certain Aberdeen granites, especially one from Cairngall, near Peterhead. It is not unlike the Dalbeattie grey; but is much darker than either of the materials mentioned. Compared with other Newry granites the peculiar spotted appearance (imparted to the stone by the felspar having a tendency to become porphyritic), so characteristic of the Bessbrook varieties, is just noticeable in the Altaveigh stone, but the small white specks in the latter are more numerous. In thin transparent sections under the microscope the rock is seen to be thoroughly crystalline; there is no matrix, therefore, and the strength of the stone lies in the interpenetration of each other by the mineral constituents, and the cohesion of these latter to one another. The principal minerals present are quartz, plagioclase felspar and biotite mica. The quartz exists in a granulated condition, filling in the irregularities left by the other minerals and locking the whole together. The plagioclase felspar which, in the majority of granites used for building purposes, is twinned, thus presenting many points of weakness, is clear and free from striations in the Irish stone under consideration, only the smaller crystals exhibiting that structure. A very peculiar and distinguishing feature in the stone is the zonal structure taken on by the larger felspars, which reminds us more of American than British granites. The mica is not very abundant; it occurs as brown, irregular crystals. Speaking generally, the micro-examination of the Altaveigh stone shows it to be of a durable character, and the only

unfavourable point in it is the presence of iron pyrite, which is apt to become weathered, producing brown stains and patches. There is not much of this, however, in the rock. The freshness of the felspar is a good omen; in most granites that mineral is much decomposed, and presents a hazy appearance. The comparative absence of mica is also favourable from the polishing point of view; it is next to impossible to obtain a good polish on that mineral, and where it exists in abundance the surface of the polished stone is usually pitted. The specific gravity of this stone is 2.71, which is rather high, the majority of granites not surpassing 2.66. This is no doubt due to the basic character of the felspar and the presence of iron pyrites. This quality renders it fit for marine works, for which stones of high specific gravity are especially suitable. As a road-metal the Altaveigh stone could not be recommended, primarily because of the granulated condition of the quartz and its brittleness. For paving stones and kerbs it would doubtless do very well. The material is practically non-absorbent; samples we placed in water for fourteen days did not turn the scale at more than half a grain, which might well be due to adherent moisture. On the whole, we are favourably impressed with this material, which, we understand, has been used to some extent locally, though from the circumstance of its not having been hitherto introduced to the market in any large quantity, it may fairly be regarded as a new granite.

NOTES.

HE daily press gave currency this week to a report that the Duke of York's Column in Waterloo-place is in a dangerous condition, that the novel stairs have partially collapsed, and that the joints of the stonework are opening. We have authority for stating that there is no truth whatever in these statements, but a few remarks about the column may be of interest just now. The column, in memory of Frederick, Duke of York and Albany, who died on January 5, 1827, was erected in 1830-3, on the site of the southern portion of Carlton House—originally built, of red brick, for Henry Boyle, Lord Carlton, on a piece of ground leased to him by Queen Anne in 1709 and bequeathed by him to his nephew, Lord Burlington, the amateur architect, and enlarged by Henry Holland for the Prince of Wales in 1783-4. This column, for which every soldier of all ranks contributed a day's pay, or about 25,000*l.* in all, was designed, after the Tuscan style, by B. Wyatt, Nowell being master-mason. The shaft, its surface fine-axed, is of red Peterhead granite; the lower pedestal is grey Aberdeenshire granite. Westmacott's bronze statue of the Duke in his robes of the Order of the Garter was raised on April 8, 1834; it weighs 7 tons 7 cwt., and is 13 ft. 6 in. high. The total height of the column is 123 ft. 6 in., its lower diameter is 11 ft. 7 in., and the upper diameter is 10 ft. 2 in. The column is a specimen of a style of monument which is an æsthetic folly, and of which we hope no more will be erected; but as a historical London landmark it should be preserved and kept in repair.

THE annual Report of the Works Committee of the London School Board shows plainly the great strides which sanitation is making in the metropolis. There is one observation in the Report which has a considerable amount of interest—namely, that better sanitation is required in the schools of the Board, which are used for only a few hours of the day, than is called for in private houses where people live and sleep. The reason is obvious: the schools are managed by a public body, incorporated for a special purpose, and this body is directly under Government supervision. If it were possible to place private houses also under

supervision, there can be no question that the health of the community would be greatly benefited. But we must be thankful that it is clear that the School Board feels obliged to be careful in this matter; the tone of the Report seems to be that of persons who consider first-rate sanitation rather a grievance than otherwise. Apart from this point it is noticeable how large is the amount of constructive work which is given out annually by the School Board. During the last year nine additional schools were opened and twenty-eight enlargements made. The loans sanctioned by the Education Department for the sites and buildings of the former amounted to 170,417*l.*: a large part of this sum has been distributed in wages among the builders, plasterers, and other artisans of London.

THE proposed destruction of the Falls of Foyers has led to further correspondence on the subject in the *Times* since we last alluded to it. One correspondent last Saturday, expressing himself as glad to head the movement "against this act of barbarism," offered to subscribe 100*l.* in aid of any well-constituted organisation for the purpose. It is to be hoped that other assistance will be forthcoming, and that something may be done, before it is too late, to put a stop to a proceeding which will not only be "an act of barbarism" in itself and in its immediate results, but will probably, if allowed, be the precursor of the similar destruction of almost every waterfall in England and Scotland. The spirit in which this kind of enterprise is regarded by engineers is charmingly represented in a letter in a previous number of the *Times* from a "M.Inst.C.E." who had been visiting the site, apparently at the request of the trading company concerned, and who maintained that no real harm was to be done to the Falls, as the company could shut off the water from their proposed factory and turn it through the falls again at any moment, and might even consent to do this at a fixed charge. The idea that there is no difference between an undisturbed natural waterfall and a waterfall which can be turned on as a "show" at so much a head, indicates at all events the utter hopelessness of any appeal to the engineering mind on such a subject.

OF the many competitions for designs of monuments we are constantly hearing of from Germany, one of the most important has been lately decided in connexion with the National Memorial to the ex-Chancellor Bismarck. This monument, which has been voluntarily subscribed for in a most enthusiastic way throughout the country, is to consist of a statue in front of the new Houses of Parliament at Berlin. Unlimited funds were at the disposal of the committee in charge of the matter, and it has been the chief ambition of this body to obtain some design that not only accords with the importance of the statesman, but also illustrates the popularity of the memorial. No less than 80,000 marks, or £4,000, were offered in premiums to ensure the participation of the leading German artists in the competition opened for the design, but unfortunately, the result has only shown that the sculptors of the "Fatherland," as a body, cannot do justice to any really important subject, and that it would perhaps even have been better to have asked for an architectural monument to Bismarck on some other site. Of the ninety-four candidates who sent in designs, the following eight have been awarded first premiums of 50*l.* each:—Herr Robert Baerwald (architect, Herr Otto Schmalz), Messrs. L. and E. Bauer (architect, Herr Grenander), Herr Jilgers (architect, Herr Bruno Schmitz), Herr Lessing (Herr H. Jassoy, architect), and Messrs. Ruemann, Schaper, Schneider, and Siemering. Ten premiums of 100*l.* and ten premiums of 50*l.* each were awarded for the designs next in order of merit, and 500*l.* given in *honoraria* where much labour had been incurred. It has not yet been decided there will be a further limited competition,

or if one of the sculptors awarded a first premium will receive the commission, with instructions to modify his design. It appears that the premiated designs have mostly been prepared in collaboration with architects for the design of the pedestal and surroundings.

IN no part of the world do matters relating to water supply receive greater attention, both on the part of scientists and of the public, than in Queensland. This is not to be wondered at when we consider that a large portion of the country owes its colonisation to the successful treatment of water supply schemes. The progress of this branch of engineering, and its dependence in the first place on the careful working out of the geology of the colony by the officers of the Queensland Geological Survey, forms the subject of an interesting report by the Government Geologist, Mr. R. L. Jack, which has recently arrived in England. He remarks that the bulk of the rain which falls in Queensland is intercepted by the belt of elevated land near the east coast. The country to the west does not receive, on an average, more than from a half to a third of the amount of rain which falls in the eastern coastal districts. In the western interior, in the intervals between rains, the rivers dry up for the most part, till it becomes a long day's journey from waterhole to waterhole. Contrasting the state of things that existed in 1882 with that obtaining at the present time, Mr. Jack remarks that thirteen years ago a typical waterhole consisted of a puddle about 10 ft. in diameter, and it was usually in possession of a large mob of cattle. "After the water had been boiled twice, and skimmed and decanted, it was good enough to make tea with." In those days it was nothing for a whole township to depart to a spot more favoured in regard to the supply of the precious fluid, returning after a rainy season, and the waterholes had become replenished. At best, however, both quality and quantity left very much to be desired. A little was done about that time by the Government, and by private individuals, in the way of conserving water in dams and tanks; but the cost was great and the supply disproportionately small. In 1885 the crisis came, for not only were cattle and sheep dying by hundreds of thousands, but even some of the western towns were threatened with extinction for want of water. A geological survey was decided upon, and then the scientists were able to show that a plentiful supply of water existed in the rocks at some depth. The report gives the geology in detail, and much of it is highly suggestive. Without entering into this, we may say that a number of artesian wells were put down, and that now there are over 200 bores in the interior, most of them successful. They are capable of producing in the aggregate 125,000,000 gallons per day. To fully appreciate what this quantity means, we may say that it is almost enough to satisfy the water requirements of London, which is, roughly speaking, 170,000,000 gallons per day. Many sterile districts in Queensland, which were practically uninhabitable, have now as much water as can possibly be required, and the cost of the whole was very little. The work has been carried out deliberately and unostentatiously, and reflects the greatest credit on the officials concerned. We must remember, though, that they were very materially aided by the goodwill of the colonists. They had very few "interests" to consult, were not reminded too often that "a source of supply properly belongs to the area in which it is geographically situated," and were not bothered about questions respecting "previous sewage contamination"; neither Royal Commissions nor County Councils dogged the heels of Mr. Jack and his assistants.

ACCORDING to Dr. S. Monckton Copeman's Report to the Local Government Board on an outbreak of diphtheria at

Potterne, in the Devizes Rural District, one of the unhealthy elements in the district consists of an old and disused mill-pond, into which the village drainage passes by a culvert, and as the mill-pond receives also the drainage from some pigsties and from a laundry on its banks, it has gradually become almost entirely filled up with a black offensive mud, which is laid bare whenever the miller runs off the water. About fifteen years ago the mill-pond was cleared out, and the drainage of the upper portion of the village diverted from it, the Vestry, at the suggestion of the Rural Sanitary Authority, paying the sum of 50*l.* to the father of the present occupier of the mill for carrying out the necessary work. Since that time numerous complaints have been made as to the condition of the millpond, and quite recently there has been some correspondence between the miller and the Local Government Board, as the result of the Sanitary Authority having served him with a notice to abate the nuisance. He contends that inasmuch as his father was paid for carrying out the work formerly, the Sanitary Authority cannot now compel him to clean out the pool at his own expense. The mill is but little used at the present time, but the Sanitary Authority do not feel justified in going to the expense of buying up the mill, which would be necessary in order to fill up the pool. Attention is also drawn in the Report, as usual, to the defective disposal of excrement and house refuse. Pails have been provided by the Authority for the reception of excrement. The emptying and cleansing of these pails at present devolves on the occupiers of the premises to which the closets are attached, and the usual proceeding appears to be to tip the contents of the pails on to the bare ground in the neighbourhood of the closet, where, unless there is, immediately adjoining, a garden unoccupied by growing crops, such material is permitted to remain for an indefinite period. This is the old story of want of authoritative control over the inhabitants in regard to the removal of such matter.

THE investigation into the recent fatal collision at Herne Bay revealed an unsatisfactory state of things on the London, Chatham, and Dover line at that station. It is approached by a curve, and the signal-box is so constructed that the official in charge is unable to see the position of affairs at the home signal. The regulations forbid him to allow any impediment to be put in front of an advancing train, until he is satisfied that the latter has come to a standstill outside the home signal; but he is practically reduced to *feeling* certain in his own mind that the signals have been obeyed. His judgment had doubtless proved correct day after day and week after week, and the interpretation which circumstances compelled him to put upon the rule in question must have appeared justifiable, until the inevitable failure occurred. The wisdom of the strict letter of the rule is always very apparent in such cases, and laxity in the observance of it is, unfortunately, nothing unusual. Why the brake failed to arrest the goods train down the rather steep gradient (1 in 100) into Herne Bay Station will, of course, be investigated by the Board of Trade. In a report of the inquest it was stated that the gradient was 1 in 10—an error easily to be accounted for, but so obviously a slip that it would be thought impossible for anyone to be misled into accepting the figures as accurate. The gradient of the climb up to the summit of Snae Fell, in the Isle of Man, opened this week, is 1 in 12; yet the *Daily Chronicle*, in commenting upon the Herne Bay catastrophe, gravely repeats that "trains run into the station down a gradient of 1 in 10."

THE recently-issued "Annual Report of the Department of Mines and Agriculture, New South Wales, for 1894," presents us with a curious appendix on the "Comparative values of Hawksbury Sandstone

and Bowral trachyte for building purposes," which shows that whatever other qualities the Government geologist possesses he does not understand much about building stones. After explaining that the sandstone in question is liable to more or less rapid disintegration when used as a building stone, he arrives at the astounding conclusion that "the nearer a building is to the sea-water the more rapid the disintegration is likely to be." The officer does not give us any particulars concerning the structure or composition of the Hawksbury sandstone, and for anything in his report the architects in the colony, or the builders for whom the comparison has presumably been made, might believe that there actually exists in that stone something easily affected by chloride of sodium. It is stated that the walls of the Central Market building, recently pulled down, "showed the disintegrating effects of the saline atmosphere in a marked degree." But beyond that bald statement there is nothing to carry conviction. From what we know of the building material in question, we are inclined to believe that, whilst the Hawksbury sandstone exists in several varieties and qualities, the circumstance that some of it does not stand well is due rather to the fact that the material is not always carefully selected for city work, than to its being placed "near sea-water." Of course, we know well enough that some building stones are specially prone to succumb to atmospheric influences in sea-side localities, but in nearly all cases where the matter has been carefully investigated, the rainfall, or undue exposure to driving rain, as compared with more favoured spots, has been held chiefly responsible for the accelerated denudation. That the best Hawksbury sandstone is inferior in point of durability to the stone commonly known in the building trade at Sydney as "trachyte" we are quite prepared to believe. The latter rock, which the report says is in reality a "syenite" (though no particulars are given to prove that), is quarried at the Gib, near Bowral, some distance from the capital; and the Government geologist sums up in favour of it on account of its crystalline appearance, and because it is "indestructible." He does not tell us, however, whether the stone takes kindly to the chisel, or otherwise, nor are there any details concerning its behaviour as a building stone. For any practical value it possesses the pseudo-scientific nonsense, constituting the appendix, might as well never have been written.

AN interesting paper on "Recent Engineering Improvements of the Clyde Navigation" has just been read at the Institution of Mechanical Engineers by Mr. James Deas, Engineer of the Navigation, one of the most interesting parts of it being the description of the concrete cylinders on which the quay walls were founded. These cylinders were about 20 ft. in diameter, and were built of segments 2 ft. 6 in. deep and 1 ft. 11 in. thick, the total height being 27 ft. 6 in., made up of eleven complete rings. The bottom ring was formed on a cast-iron cutting ring of inch metal and 2 ft. deep. The cylinders were sunk by loading with 300 or 400 tons of iron, and at the same time digging out the enclosed sand and gravel by specially-designed excavators. When they were sunk to the full depth, they were cleaned out and filled solid with concrete. The concrete for the walls of the cylinders was composed of one part strongest Portland cement and five parts gravel or broken stone and sand mixed by machinery and well rammed into wooden moulds. Foundations of this kind have occasionally been used for large buildings on wet, soft ground, and the principle might with advantage be more frequently adopted.

THE third half-yearly report since the opening of the Canal was submitted to the shareholders of the Manchester Ship Canal on Tuesday last. It is not an exhibi-

rating report. The capital expenditure now stands at very nearly fifteen millions, while the profits from the working of the Ship Canal for the half-year are only 7,000*l.*, and of the Bridgewater undertaking about 13,000*l.* In all, therefore, a little over 25,000*l.* are available for interest—a mere trifle, for the half-yearly interest due on mortgage-debentures alone is upwards of 160,000*l.* The only satisfactory feature about the report is that the traffic and profits are steadily increasing.

WE regret to hear that the Municipal Council of Avignon have passed a resolution to memorialise the Government in favour of the demolition of the ancient ramparts of Avignon on the side facing the river. The artists and archaeologists interested in the place are, of course, opposing the scheme as strongly as possible. The fortifications, which date from the fourteenth century, are classified among the "Monuments Historiques," and it is hoped that the Government will refuse its consent. There are no doubt cases in which it seems almost necessary, for a town which is increasing in its modern development, to disturb ancient fortifications, though sometimes the necessity is more fancied than real, and the demolition results in depriving a town of a great deal of its picturesque and historic interest without really giving it any compensating practical advantages. But the interest of Avignon, in a historical sense, is so exceptional that only the most indubitable proof of sanitary necessity could justify the destruction of its ancient appearance.

AN architect has forwarded us a copy of the instructions to architects for a competition for a new school for the School Board of Swansea, from which it appears that after offering some very meagre premiums they promise that the architect whose design is placed first by the assessor will "probably" be appointed to carry out the work at a commission of 4 per cent. on the outlay, which commission is to include travelling expenses. The assessor is Mr. E. R. Robson, and we should naturally like to know whether he was consulted on these provisions and assented to them. We should hardly think so. Instructions for competitions are often drawn up before the appointment of an assessor, and without his being consulted in regard to them; a great mistake, which often leaves room for misunderstandings and injustice that might easily have been avoided. Has it been so in this case?

THE ARCHITECTURAL ASSOCIATION ANNUAL EXCURSION.*

Wednesday.

ON this day the excursionists went somewhat far afield, some sixty miles of railway travelling as well as coach riding, forming part of the day's proceedings. Despite this somewhat large encroachment on their time, general satisfaction was expressed with the excellent bill of fare provided for the day. Detraining at Moreton-in-the-Marsh, the party drove to Batsford Park, a new house erected for Mr. A. B. Freeman-Mitford, C.B., from the designs of Messrs. Ernest George & Peto. This was generally regarded as one of the happiest designs of Mr. Ernest George, and the somewhat novel experiment of visiting a modern building on an A. A. excursion was universally approved. The house is built of Chipping Campden stone, with stone slates on the roofs from the Forest of Dean, and the delightful colour of these materials was fully appreciated. Internally the chief features are the two-storied great hall, with staircase at one end, and the ball-room; but these are by no means all, as with Mr. Ernest George's customary thoroughness, every detail is a source of pleasure. The gardens are charmingly laid out, and suggest, with their terraces and garden-houses, reminiscences of Monticute. After considerably more than the schedule time had been

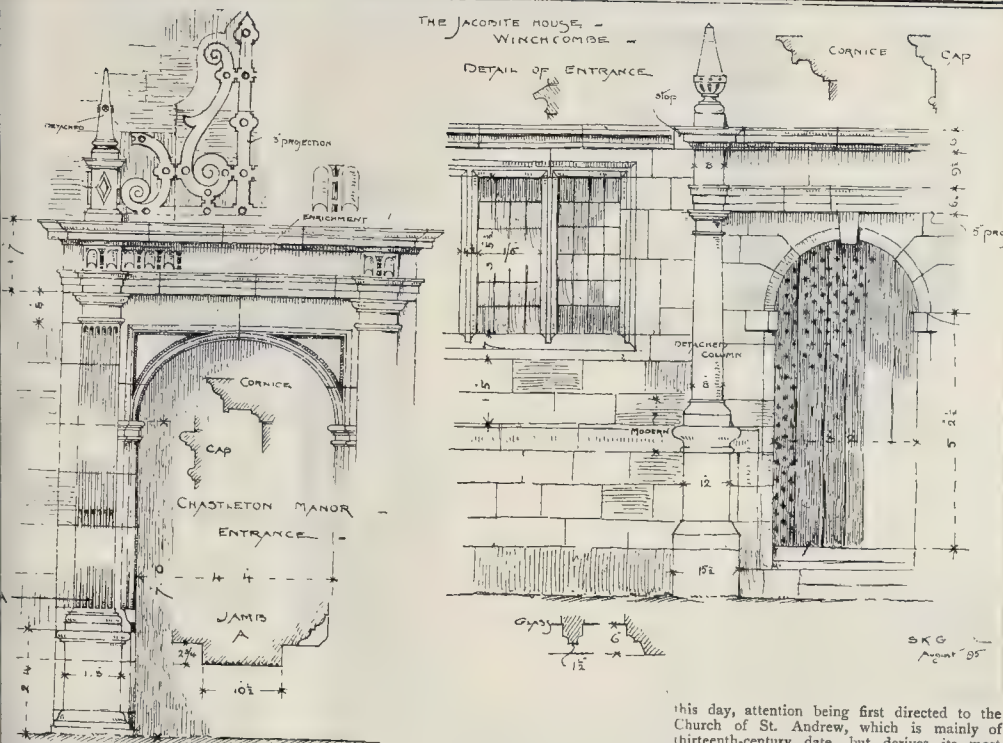
most enjoyably and profitably spent, even though sketching, in accordance with the general Association etiquette, was tabooed, the excursionists returned by way of Moreton-in-the-Marsh, where a short halt was made to inspect the market-house, the gift of Mr. Freeman-Mitford to the town, and erected from the designs of Messrs. Ernest George & Peto to provide a permanent home for the ancient market, first instituted in the reign of Henry III. by the Abbot of Westminster, then lord of the manor. Thence the party proceeded by way of the four-shire stone (marking the junction of Gloucester, Worcester, Warwick, and Oxford) to Chastleton, which although the scene of a battle in 1016 between Edmund Ironside and Knut, when the latter was defeated with great slaughter, is of more interest from the existence and history of the Great House. After being for many years in the hands of the Catesby family, Chastleton was, in 1602, sold for 4,000*l.* to Walter Jones by Robert Catesby, the devisor and principal leader of the Gunpowder Plot, and part of the purchase-money was devoted to buying the gunpowder. Walter Jones, a rich woollen merchant, of Witney, pulled down the Catesby house, and commenced the erection of the existing one in 1603, completing it probably in 1614. certainly, at his death in 1632, the house was comfortably and fully furnished, and much of the furniture included in the inventory of his effects is still to be seen in the house he erected, which remains much as he left it, with the exception of a new roof and some further necessary repairs carried out by John Jones, who possessed the property from the death of his father in 1761 till his own decease in 1813. Full of interesting panelling, chimney-pieces, ceilings, and old furniture, the house provided ample occupation for the sketch-books of the party during the two and a-half hours of their stay, the long gallery, 70 ft. by 28 ft. 6 in., with its beautiful segmental plastered ceiling being, although now somewhat dilapidated, possibly the chief centre of attraction. Little heed was given to the small church of St. Mary, part of which still comprises some of the work of Bardolf de Cestreton, who built in A.D. 1100 a church on the site of an ancient British burying place. The church was further enlarged by Roger, son of Bardolf, and a subsequent Bardolf de Cestreton, and is quaint and picturesque, with several attractive features, old tiles, a Jacobean pulpit, southern tower, sanctus bell turret, and several brasses. All too soon the party quitted Chastleton to catch the train at Chipping Norton Junction for their return to Cheltenham.

Thursday.

Once more the railroad was utilised, and the party proceeded by train to Evesham, where they were met by carriages and driven to Broadway, the straggling village of hardly more than one street, on the wide part of the high road from London to Worcester, which justifies the name of the village. Full of picturesque houses, mostly of the seventeenth century, Broadway derives its interest rather from the grouping of its houses and their colour, mostly the accidental effect of time on the universal stone building, than from richness of detail. It is, indeed, a much-needed lesson to many of our modern architects: the small value of detail and the greater power of sobriety, good proportion, and massing. The richest buildings are the "Lyon Arms," of 1620, the old Priory House of the Abbey of Pershore, and the so-called Tudor House. The church, dedicated to St. Eadburga, is about a mile south of the village, and was accordingly visited by few of the party, who found the time at their disposal all too short for sketching in the village. The church is nevertheless well worth a visit for a study of simple, well-designed grouping with its central tower, nave, aisles, chancel, and low transepts.

Broadway is but one, although possibly the largest, of many interesting stone-built villages of like character in the immediate neighbourhood, such as Stanton, Saintsbury, and others nestled in the Cotswolds which might, had time permitted, have been advantageously included in the programme, and at one such village, Buckland, short halt was made. The Church of St. Michael, chiefly of late thirteenth century Early Decorated work, with Perpendicular clearstory and chancel, and possesses a considerable amount of ancient woodwork, fifteenth century pews and sixteenth century wall-seats with canopies, and good eighteenth century west gallery and pulpit. There is also some good fifteenth century glass in the east window, the remains of a rood-loft stain a sanctus bell-cote, and a west tower of admirable proportion and cleverly designed buttressing, the churchyard the cross has been restored, the base only being original.

* Concluded from last week, p. 118.



S.K.G.
Aug 2 95

Buckland has amongst its old houses the peculiarly interesting rectory, built by the Abbots of louches, and largely of fourteenth-century date. The hall particularly is worthy of study, with its hammer-beam roof and timbered gallery. Some of the cusped windows in the hall have their original shutters, and indications remain of these having existed in the upper lights, where they were frequently omitted in work of this date. Some charming old glass is well preserved in the windows, both in the upper and lower lights.

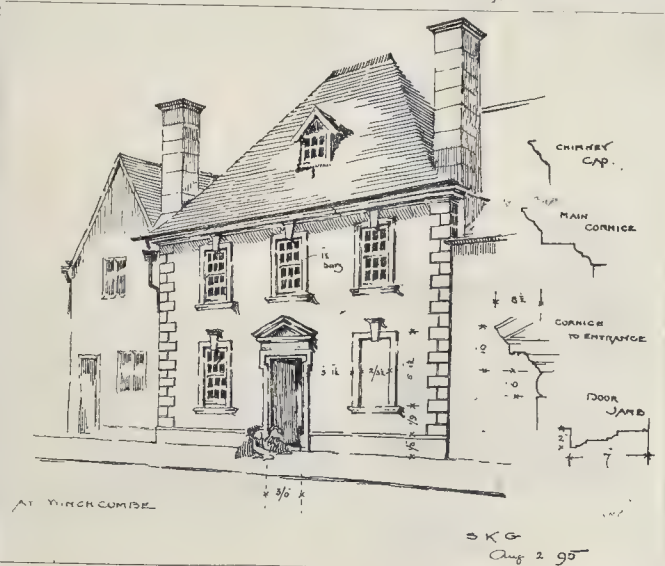
From Buckland the excursionists drove through Stanton without stopping, to their final objective point of the day, Stanway Hall. This is the residence of Lord Elcho, and is said to have been designed by Inigo Jones for Sir Paul Tracey. The house bears generally a thoroughly Jacobean character, but with some detail that has been supposed to be later work, and it may be suggested that these apparent variations are the result of Inigo Jones's journey to Italy in 1612, which, although not the first, was in all likelihood the most important in its influence on Jones's knowledge and ability. As Paul Tracey became a baronet in 1611, and died in 1626, it is hardly reasonable to conjecture that in Stanway Hall we have an example of the work of Inigo Jones, before and after the refining and moulding influence of Palladio and the Italian Renaissance had brought his powers of design to their highest point of excellence. The design, whether by Inigo Jones or not, is evidently the work of a master hand, and the effect, particularly of the entrance courtyard, is remarkably satisfactory, with its gatehouse at one end, gateways on two sides, and the house with its immense bay-window on the hall on the remaining side. Internally, there is little of interest beyond the great hall, as repeated alterations and re-arrangements have obliterated much of the original disposition. The grounds are pleasing, and still retain sufficient of their former formal arrangements to give piquancy of interest. In the grounds is an old timber-barn of considerable size, which formed part of the possessions of the Abbey of Tewkesbury, to which community Stanway belonged until the Dissolution, and the transfer of the property to William Tracey, grandfather of the builder of the house. The church adjoins the courtyard of the house, and the

church is an excellent example of a Tudor restoration of an earlier structure, much of the old masonry, including even some Norman corbel tables, having been re-used in the almost complete rebuilding. The general effect of the church is good, largely due to the pleasant proportions of the square tower. A two hours' ride from Stanway brought the excursionists back to Cheltenham.

Friday.

Sevenhampton was the first village visited on

this day, attention being first directed to the Church of St. Andrew, which is mainly of thirteenth-century date, but derives its most piquant feature from the peculiar arrangement of the Perpendicular central tower, which extends partly into the chancel and partly into the north and south transepts, necessitating internal flying-buttresses from its western piers to the western wall of each transept, and reminding the excursionists of Minster Lovell Church, in Oxfordshire. The south porch has a very charming doorway, with four centred arch and pierced tracery head. There are a few late brasses in the church of some interest. The manor-house is a good example of the usual seventeenth-century type, picturesque in its grouping and simple in detail. A pigeon-cote and a seventeenth-century sundial in the garden attracted and occupied the pencils of many of the excursionists during the short time of their stay.



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CHASTLETON CHURCH

Sketch from the Manor House.

From Sevenhampton the party proceeded to Charlton Abbots, another manor-house at which place is the chief attraction. In this house are a few doorways and panelling worth study, and a staircase of similar type to that at Postlip, with solid oak steps around a square central pier. The greater number of the members turned their attention to the exceedingly picturesquely-arranged group of farm buildings following the slope of the hill on which the house stands. The church received small notice, being at the bottom of a steep hill, and the day being very hot.

The midday halt was made at Winchcombe, where a lengthy stay of two and a-half hours enabled the excursionists to see pretty thoroughly the many objects of interest. Winchcombe is still a market town of considerable size and importance, and of great antiquity. Anciently it was called Winchelscomb, of which its modern name is obviously a contraction. During the Heptarchy, if not the metropolis of the Kingdom of Mercia, it was at least the residence of some of the Mercian Kings, of whom Offa founded a nunnery here in A.D. 787. Cenulph, who succeeded to the throne of that kingdom after the decease of Egferth, Offa's son, who survived his father only a few months, had a palace here, and in 798 A.D. laid the foundation of the stately abbey for 300 monks of the Benedictine order, which he endowed with an ample revenue, and dedicated with unusual splendour to the Virgin Mary. Cenulph, in the year 819 A.D., was buried in the abbey which he had founded, where also the remains of his son and successor, Cenelm,

were deposited. The young king, after a reign of one year, having been, according to some, accidentally slain, or, according to others, cruelly murdered at the instigation of his unnatural sister, Quendreda, in the hope thereby of securing to herself the throne, was first obscurely buried, and afterwards, on the discovery of the deed, removed with much funeral pomp and interred near his father in the abbey church. He was at length canonised, and the numerous pilgrimages made to his shrine much augmented the revenue of the monastery, which was subsequently re-dedicated to the Virgin Mary and St. Cenelm. The abbey afterwards came into the possession of secular priests, and had almost fallen into decay when Oswald, Bishop of Worcester, in 985 A.D., reformed its discipline, recovered the lands of which it had been deprived, and restored it to the Benedictine monks, who held it till the Dissolution. This was a mitred abbey, and its possessions were numerous, for, at the period of the Norman survey, no fewer than nineteen manors were annexed to it, independently of Winch-

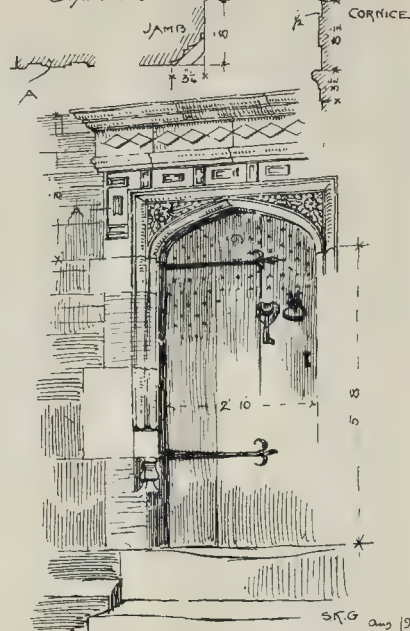
combe itself, but the monks having opposed the Conqueror, were by him deprived of many of their lands. The buildings are reported to have been exceedingly magnificent, and the establishment so prosperous at one period, that it is said to have been "equal to a little university." Very few traces of it, however, remain; but a memorial is preserved in the name of a hamlet still called the Abbey demesnes. The cultivation of tobacco, which is said to have been first planted in Winchcombe after its introduction into this country in 1583, was, for a considerable time, a source of much profit to the inhabitants, but in the twelfth year of the reign of Charles I., that trade being restrained, the plantations were neglected.

The church of St. Peter, partly erected by Abbot William in the reign of Henry VI., and completed at the expense of the parishioners, munificently assisted by Ralph Boteler, lords of Sudeley, is a fine and spacious example of Perpendicular work, but the detail is somewhat coarse. It is one of the few examples of a church without a chancel arch, the division between nave and chancel being marked by a screen and an elaborate upper screen or glorified roof truss. The font, dated 1634, is a curious instance of the Jacobean attempts to follow Mediaeval lines. The church has been thoroughly restored, but contains a few fragments of old glass, an eighteenth-century chandelier, and an ancient almsbox.

In the town there are many picturesque houses, chiefly of seventeenth-century date, the most striking being the so-called Jacobite house close to the church, which has an old German wrought-iron handle to its garden-door that afforded much employment to the excursionists. The alms-houses founded by Lady Dorothy Chandos, of Sudeley Castle, about 1573 A.D. were nearly rebuilt in 1841, and contain only a few fragments of the older structure.

From Winchcombe a short drive brought the party to Sudeley Castle, said to have been built by Boteler, Lord Sudeley, in the reigns of Henry V. and VI. He, however, sold it to Edward VI. for fear of confiscation, and by him it was granted to his uncle, Lord Seymour, who married Queen Katherine Parr, many of whose personal effects are here to be seen. Mary bestowed it upon Sir John Bridges, whom she created Baron Chandos of Sudeley, whose grandson, the third Lord Chandos, here entertained Queen Elizabeth in 1592 A.D. George, the sixth lord, having embraced the cause of Charles I., the castle was twice besieged by the Parliamentary forces, who reduced it to ruin. It was purchased by the Dents, and restored under Drayton Wyatt, with

DOORWAY AT STANTON.



STANTON. GATEWAY BETWEEN HOUSE AND CHURCH

S.K.G. Aug 95

the exception of the banquetting-hall, which still remains charming in its ruin, a mere shadow of its former splendour. The house is now a marvellous museum chiefly, but not entirely, of memorials of the Tudor and Stuart period, rich in pictures, tapestries, furniture, and especially silver, and by permission of Mrs. Dent these were seen. Mrs. Dent accompanied the party, and afterwards entertained them at tea in the hall. The chapel has much that is of interest, and was restored by Sir Gilbert Scott and Drayton Wyatt. A formal garden and an old ruined tithe-barn are also among the objects of interest.

Leaving Sudeley, a charming drive over the Cotswolds, by way of Postlip and Bishop's Cleeve, brought the party back once more to Cheltenham, where, in the evening, was transacted the usual business of electing an Excursion Committee for the next year, and discussing future fields for exploration.

Saturday.

Leaving Cheltenham by rail in the morning, the excursionists proceeded to Gloucester, where they were met by Mr. F. W. Waller, F.R.I.B.A. Visiting first the Deanery, a considerable time was occupied in listening to the theories and speculations of the Dean on the archaeology of the Deanery, so that the time possible for the Cathedral was somewhat limited, and Mr. Waller had to hurry the party more rapidly than either his subject or his inclination would have otherwise dictated. Much interest was displayed in the charming wall-tablet to the memory of Canon Evan Evans, Master of Pembroke, designed by Mr. H. Wilson, and executed by Mr. F. V. Pomeroy, in bronze and silver, Mexican onyx, and lapis lazuli.

After luncheon, Mr. Waller again escorted the excursionists through the City of Gloucester, pointing out the old houses and churches and some of the most notable modern buildings. Then in the evening the party broke up after one of the most enjoyable of recent excursions, the beautiful country and the fine weather, which was uninterrupted after Tuesday, contributing largely to the success of the outing, and minimising the inconvenience of the large amount of travelling which the selection of Cheltenham as a centre necessitated.

THE BRITISH ARCHEOLOGICAL ASSOCIATION:

ANNUAL CONGRESS.

THE Fifty-second Annual Congress of the British Archaeological Association commenced on the 12th inst., at Stoke-upon-Trent, by the invitation of the Mayor and Corporation of that ancient town.

A large party of the members of the Association, of the Reception Committee and their friends, assembled in the Council Chamber of the Town Hall (which was kindly placed at the disposition of the Congress for the evening meetings), and a hearty welcome to the town of Stoke was accorded the Association by the Mayor, Mr. J. Birks. Mr. W. S. Brough, on behalf of the members of the North Staffordshire Field Club and Archeological Society, also offered a cordial welcome to the visitors.

The Duke of Sutherland, the President of the Association, being unable to attend the meeting, Mr. Thomas Blashill, one of the Vice-Presidents, in the regrettable absence of the Treasurer, Mr. E. P. Loftus Brock, F.S.A., through serious illness, acknowledged the heartiness of the welcome that had been extended to the Association, and said he fully believed they would have an instructive and pleasant week in the district. They were prepared to see much that would interest them, and they knew there were many good archaeologists in the neighbourhood, who were devoting their time and energies to afford them the fullest information upon the different subjects that would occupy their attention during the coming week. Under such circumstances they could not fail to have a successful and pleasant meeting.

In order to save time, the inaugural address, instead of being delivered now, was postponed until the evening, and a move was made to the Parish Church of Stoke, where, in the chancel, Mr. Chas. Lynam directed the attention of the members to the monument to Josiah Wedgwood on the north wall. This monument was originally in the old church, but was removed in 1830, when the present church was built. Wedgwood himself lies buried in the old churchyard. Under the leadership of Mr. Lynam the members next proceeded to the churchyard, where he drew the attention of the party to the, perhaps, oldest-worked stone in the County of Stafford, viz., the

remains of the old churchyard cross. It was dug up beneath the foundations of the chancel of the church in digging a grave some years ago. It was disintegrated in fragments, but upon being pieced together it became evident it had been used as the lintel of a door. There can scarcely be a doubt that it once formed a portion of the shaft of an ancient cross, and it was thought better to re-erect the pieces of the stone without adding anything, and leave them to tell their own story. Mr. Lynam said that Stoke had always been an independent parish; it was of Saxon origin, and had never been subject to monastic or other ecclesiastical organisations.

A heavy storm of rain now commenced, notwithstanding which the party proceeded to view the remains of the ancient church, a few yards distant, which had been recovered by Mr. Lynam, and re-erected by him as they are now to be seen. Mr. Lynam said that about fifteen years ago some ancient mills stood near the churchyard (the Glebe Mills, Boothern), the river Trent being only a few yards away, and those mills caused the damming of the water, resulting in the periodical flooding of the district. The mills were removed, and some stones which had been used in the construction of the weir and bye-wash were brought to light. These proved to be stones belonging to the original arcade of the south side of the nave, with the respond piers of the north arcade, and at length the whole of the stones forming the arches and piers which they now saw were recovered from the river, and by the desire of the then rector, now the Bishop of Shrewsbury, they were built up again exactly in their original position as nearly as could be ascertained. These remains consist of two bays of the original Norman nave. The foundation-walls of the chancel were then unearthed, and the jambs of the priests' doorway on the south side were disclosed, also the foundation of the south porch beneath which lie the remains of Josiah Wedgwood and his wife and their youngest son, Thomas. On the north wall of the present church there are marble tablets to the memory of each of the Wedgwoods. The thirteenth-century altar-slab and the font are also still within the area of the old church, and there are several carvings of Early Norman date built up in the walling of these arches. Thus these original arches, being well buttressed and the walling protected from the weather, are likely to stand for many years a conspicuous feature in the old churchyard, and a fitting memorial of Mr. Lynam's indefatigable zeal as an archaeologist. The old stones have not been shaped or tooled in any way, but are built up just as they were taken from the river.

Carriages were now taken for a drive to Bury Bank, near Stone, and the rain ceasing, the weather cleared, and a lovely afternoon succeeded. Bury Bank is situated on the Trentham estate of the Duke of Sutherland, and by his Grace's permission the archaeologists, under the guidance of Mr. Collins, traversed the great earthwork, and having reached the summit, Mr. C. Lynam gave an interesting description of this ancient camp. The plan, he said, was that of an irregular ellipse about 140 yds. in length and 100 yds. in width, the area being about 3½ acres. Whether or not the origin of the camp was British, as some antiquaries thought, there could be no doubt of its having been occupied by the Saxons. The camp consists of an encircling wall or vallum, 30 to 40 ft. wide and about 5 ft. in height, beyond this a broad flat space forms the top of the great fosse, which is bounded by a second wall along the slope of the hill. The camp is approached on the north-west by a narrow roadway between two long-flanking mounds of irregular shape protecting the entrance. The earthworks are well preserved and clearly-defined, and from the top of the mound a magnificent view is obtained, Stafford Castle being distinctly visible. Some extracts from Dr. Plot's "History of Staffordshire" were read by Mr. Lynam, from which it appears that Bury Bank was the seat of Ulfusus, King of Mercia (657 to 676), who, tradition asserts, murdered his two sons for embracing Christianity.

Returning to the carriages, the party proceeded to Trentham Hall, where they were received by the Rector of the Parish and conducted to the church immediately adjacent, and which serves as chapel to the Hall. The church has been rebuilt, but the Transitional Norman nave arcade remains. There is some very good Jacobean woodwork in the chancel and side screens. The visitors were conducted through the hall, and admired the collection of antiques and other treasures, and were provided with tea and fruit served in the

sculpture gallery. The gardens were greatly admired. Returning to Stoke after a pleasant drive of some ten miles, the members of the Congress reassembled in the evening at the Town Hall at a conversazione as the guests of the North Staffordshire Field Club and Archeological Society.

Here they were received by the President of the Society, Mr. Wells Bladen, and after a short interval Mr. W. S. Brough delivered the inaugural address, and read a most interesting paper entitled "Notes on North Staffordshire," in which he summarised, in an admirable way, the general history of the county. "In the days of the Britons," said Mr. Brough, "Staffordshire was called the holy district, or the country of the priests." Owing to its altitude and the inclemency of the climate in the winter, and the many natural fastnesses almost impregnable in the warfare of those early days, it continued the stronghold of the Britons against the assaults of the Romans, and remained unconquered and uncivilised. To the Saxons, also, the Britons here presented an undaunted resistance, and the hills of Staffordshire had witnessed many a fierce encounter. The county in early times was in great part covered by immense forests, in which the bear, the wolf, the beaver, the wild boar, the badger, and the wild bull ranged at will, and traces of these animals remained in the place-names of the present day, such as Wild Boar-clough, at the foot of Shuttleslow, Badgers'-clough, and many others. Amongst the dwellers in the wild district of Biddulph Moor there is a tradition that, during the period of the third crusade, Herbert de Langtry brought thither twelve Saracen captives. At all events, the dwellers in that region had distinctive characteristics; their cottages were scattered over the moor, and the people did not congregate, the men were black-haired and swarthy in appearance, and the women were often red-haired. Their dialect was quite different from that of North Staffordshire, and some of their words could be traced to an Arabic source. Mr. Brough also directed attention to the great natural beauty of the county, and said that from Cloud Hill might be beheld one of the finest views in England, embracing nine counties. After a cordial vote of thanks to Mr. Brough for his most able paper had been moved by Mr. Thos. Blashill and enthusiastically accorded, Mr. A. Scrivener exhibited, by the aid of the lime-light, a large number of photographs of places to be visited by the members of the Congress during the week, and at about eleven o'clock the company separated. A valuable and interesting collection of objects of antiquarian interest was exhibited by ladies and gentlemen of the neighbourhood, and remained on view until the middle of the week.

On Tuesday the members and visitors set forth at an early hour from the hotel for a long day's driving. The weather was uncertain, and there were several heavy showers. The first halt was at Abbey Hulton, a thirteenth-century Cistercian house, the foundations of which were disclosed some fifteen years ago, previous to which date no vestige remained above ground, but, in excavating for the foundations of the farm-house, which now stand exactly on the crux of the old church, remains of the old buildings were met with, and by direction of the owner, the late Rev. Walter Sneyd, further investigation was made, and many relics were found, including tiles, some highly glazed, exhibiting a great variety of patterns, mostly of thirteenth century date. Some Roman pottery was also discovered, and a leather bottle dug up in a field in the abbey grounds. A coffin containing the supposed remains of Lady Elizabeth Audley, the hair being found in good preservation, was also discovered. Most of these relics were removed at the time to Keele Hall, the residence of Mr. Sneyd, where they are carefully preserved. Mr. Lynam described the abbey, and said there was scarcely a single feature of the abbey which had not been brought to light with more or less precision, and he had been enabled to lay down an accurate plan of the original establishment. The church lay to the north, its longer axis east and west, the cloister garth was on the south, the chapter-house on the eastern side, the refectory on the south side, and on the west the domus conversorum, the frater or day-room running north and south in continuation of the chapter-house range. A stream which came from the hills eastward of the site supplied the house with water, and furnished the power for the abbey mill, which stood to the south-east of the conventual buildings, and supplied the pools which surrounded the buildings on the north and east sides, the tail water of the mill running into an elaborate

system of fish-ponds lying between the abbey buildings and the river Trent. The abbey was founded in 1223 by Henry de Audley, and it was dedicated to the Blessed Virgin and St. Benedict. It is situated in the parish of Burslem. The party now proceeded to Milton station for the train to Leek, where Mr. Brough, the leader for the day, conducted them to the Parish Church dedicated to St. Edward. Mr. Lynam described the building, and said it had always been the prominent feature of the town, which was known as the metropolis of the Moorlands. In 1296 a monk of Croxden Abbey recorded that the church at Leek, and the whole town with it, were burnt down. There are no remains of the church of that early date, but the remains of its immediate successor, together with other additions and alterations, are so numerous as to render this church an exceedingly puzzling problem to the ecclesiologist. Mr. Lynam has been for some time past making a study of its very interesting and most perplexing features, with the view of producing a monograph of its architectural history. The earliest portion of the existing building appears to be the lower part of the tower situated at the west end of the nave. It is a fine tower, with an embattled parapet, having eight pinnacles, the upper stages being at least of two different dates. There seems to be evidence of fire on some of the stonework. Round the base of the church there are twelve different characters of moulding, and the numerous alterations the fabric has undergone render an intelligible description of the church hopeless without illustrations. There are two very large rose windows which might have been transept windows at one time, probably additions to the earlier church. The interior of the church is, if possible, more difficult of interpretation than the exterior. The timber roof is remarkable. The porch is dated 1670. In the belfry of the tower is preserved the old cuckoo-stool. The registers date from 1621. In the churchyard there stand the remains of two early crosses of perhaps pre-Norman date, similar in their foliage and interlaced work to those in other Staffordshire churchyards.

After luncheon at the Swan Hotel, carriages were again in requisition for the drive to Dieula-Cresse Abbey. The remains of this old Cistercian foundation above ground are very scanty; only some fragments of walling and portions of the piers of the crossing, the south aisle and south transept, now remain. The Rev. W. Beresford, Vicar of St. Luke's, Leek, described the remains. The abbey was founded in 1214, by Randal de Blundeville, Earl of Chester, in consequence of a remarkable dream he had had by which he was directed to partake of the Blessed Sacrament at the Abbey of Poulton, in Cheshire, and afterwards to translate some of the monks to Leek. Leaving the abbey, the drive was continued through a beautiful country, and beside Rudyard Lake to Rushton Church. This very quaint little building is known as the "Chapel in the Wilderness," a name characteristic of its lonely and secluded situation at the head of Rudyard Lake. It was originally entirely a timber building; the roof timbers of oak are of massive dimensions, and the under-sides of some still show the grooves which received the upright boarding of the sides. The walls are now of stone. It has undergone many changes, but is still a building of great picturesque quality. The Rev. S. Thomas, the Vicar, received the visitors. He said the church belonged to the family of Swythamley, and members of that family were formerly buried in the chancel. The sanctuary was supposed to be the oldest portion, and was of the thirteenth century. On either side of the little porch were stones, supposed to be Druidical. Rain again began to fall very smartly as the drive was resumed, but the ancient remains known as the "Bride Stones" on Biddulph Moor were reached. These consist of several large stones, supposed to be a part of a Druidical circle, and are the more interesting as being the only known prehistoric monument in the county of Stafford. Some charcoal and human remains had been found in excavating around them. Biddulph Old Hall was reached soon after, where the members and visitors were cordially received, and offered tea and light refreshments by the kindness of Mr. W. T. Tayford. The ruins of this very interesting old Elizabethan house (date 1580) occupy an extensive area. The Hall was greatly damaged by the cannon of the Parliamentarians, being held for the King by Sir Francis Biddulph. Fire afterwards greatly increased the damage done, and finally plunder and decay completed its ruin. Time pressed so much that only a very short stay could be made in order to get back to Stoke by special train. In

the evening at the Council Chamber of the Town Hall, under the chairmanship of Dr. A. M. MacAldonie, a paper on "Staffordshire Folk-Rev. W. S. Lach-Szyrma, D.D., on the "Con- version of the West and Midlands of Britain" was read, in the author's absence, by Mr. Geo. Patrick, Hon. Sec. Mr. W. de Gray Birch, Hon. Sec., also read a paper by Mrs. Collier, entitled, "Historical Notes on the Town and Priory of Stone, co. Stafford."

On Wednesday Mr. A. Scrivener was the leader of the party, and under his guidance the members travelled to Lichfield by train. The cathedral was soon reached by carriages from the station, and while waiting the conclusion of the morning service, Mr. Scrivener explained by the aid of a large ground plan the various dates of the building. Very soon the Dean, the Rev. Dr. Luckock, came to meet the company, and kindly conducted the members round the edifice. Commencing his remarks at the north transept, he pointed out the remains of the Early Norman building in the arch of the north choir aisle. The window of the north transept was a restoration of the old thirteenth-century window, and replaced a de- based Perpendicular one which had become dangerous. On taking it out, the old stones and arches of the former were discovered, only a few being missing, so that the restoration was a genuine one. Passing into the choir aisle, the Dean pointed out the skilful manner in which the entrance to the chapter- house was effected, and, leading the way through the vestibule, the visitors entered that building, which, said the Dean, was believed to be unique, the central pier, from which the ribs of the groining radiate, being extended upwards, and carrying the vaulting of the apartment over it, which is now used as the library of the Cathedral. Here the visitors were shown some rare MSS., particularly St. Chad's Gospels, containing the Gospels of St. Matthew and St. Mark, date 720 (this book originally came from Llandaff); also an illuminated MS. of Chaucer's "Canterbury Tales." De- scending to the Cathedral, the Dean led the way into the choir, pointing out the various features of importance, and, in the Lady Chapel, he explained the Flemish sixteenth century glass brought from the Abbey of Herckenrode, in Belgium, by Sir Brooke Boothby, in 1803. Passing through the south aisle of the choir and down the nave to the west end, the very pronounced deflection of the axis of the eastern end was noticed, and then the party followed the Dean round the exterior, where, with a hearty vote of thanks from the members, he took his leave. The present cathedral is the successor of a series which have occupied the same site from the days of St. Chad, about 670. It was commenced about 1200, and was completed about 1376. It was illustrated and described in the *Builder* Cathedral Series, in 1891.

The company now adjourned to the Swan Hotel for luncheon, and afterwards departed by train for Tamworth and visited the fine church dedicated to St. Editha. The vicar, the Rev. E. D. Pollock, received the party, and, in the chancel, read a short description of its foundation and history. Originally founded in 963, it was in 1069, a collegiate church with a dean and six canons. There are considerable remains of Norman work, and the original structure seems to have consisted of a nave, chancel, and north and south transepts with central tower. The east and west arches of the tower have been cut away, and the chancel and nave are now undivided. A great fire destroyed the tower and the church in 1335, and the marks of the conflagration can still be seen upon the Norman masonry. The present western tower was erected in the fifteenth century, and possesses the peculiarity of a double staircase for the college and the parish fingers; one entered from the church, and the other from the outside, and one staircase passes over the other. There is a crypt beneath the south aisle, with the remains of a fresco painting, and some stone coffin-lids can be seen built into the roof, of about the fourteenth century. The nave consists of four bays, late fourteenth century. In the north transept there is a chapel to St. Nicholas. Some traces of herring-bone masonry may be observed in the older portions of the building. The south side wall of the chancel was originally an exterior wall, and a Norman window and doorway and flat buttress remain in the present aisle. Over the north porch is a muniment-room. There are several interesting monuments—one an altar-tomb with recumbent effigies of Sir Baldwin Freville and his wife, date 1400, and one to Lady

Jane Freville, date 1339; also an altar-tomb and effigies of Sir John Ferrers and Lady Dorothy, 1512. The church was restored in 1876 by Mr. Champneys. Mr. Thos. Blashill made some remarks upon the church, pointing out its peculiar characteristics, and considered that it was originally a church without aisles. Tea was offered the visitors by the Vicar at the Vicarage, and then the party walked to the ancient castle, and Mr. Blashill gave a general history of the fortification. The high and steep mound upon which the castle stands is said to have been thrown up by Queen Ethelfreda in 918. The castle is not mentioned in "Domesday," says Mr. G. T. Clark in his "Military Architecture." It is, with half the town, situated in Warwickshire, the church and the other half of the town are in Staffordshire. Mr. Blashill traced the ownership of the castle from the De Spencers and Marmions to the present holders the family of Townshend. He also pointed out the remains of herring-bone masonry in the walls. The keep was a shell keep after the type of Corfe and other examples.

The train was taken back to Stoke, and in the evening the members were entertained by the Mayor (Mr. Birks) and the Mayoress at a conversation at the Town Hall, when Mr. Scrivener continued his exhibition of lantern views of places of interest in the county, describing very clearly their principal characteristics. The exhibition of curiosities was also on view, including some examples of the "New Race" pottery lately discovered by Professor Flinders Petrie in the Nile valley, contributed by Mr. E. P. Loftus Brock, which excited much attention.

On Thursday the excursion was a very long one, for leaving the hotel about 8.40 a.m. Stoke was not reached again until nearly 8 p.m. Under the leadership of the Rev. T. W. Daltry the party proceeded first by train to Newcastle-under-Lyme, where, at the Town Hall, the ancient charters and regalia were inspected by the courtesy of the Mayor and Corporation.

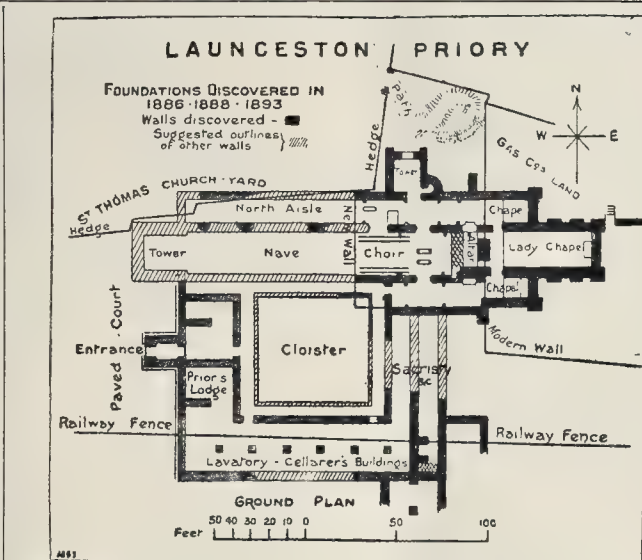
These were described and commented on by Mr. Walter de Gray Birch, F.S.A., Hon. Sec. The oldest is of Edward I.'s reign, and is the grant of a fair on the vigil and day of the Holy Trinity, and is dated at Westminster 1279. There are also some private charters of Edward III. The Corporation books date from 1368. The maces are of silver, and dated 1689 on the crowns, which are of a later period than the stems. These charters and regalia were not as well preserved as they should be, but the Mayor said the suggestions which had been made for their safer protection should be considered by the Corporation. Carriages were taken to the Roman station at Chesterton, which was very clearly explained by the Rev. T. W. Daltry, who was of the opinion that here should be sought the missing Roman station of Mediolanum. The measured distances tally very closely with the distances recorded by Antoninus in his Tenth Itinerary, and he remarked that, if Chesterton be not Mediolanum it follows that its Roman name is entirely lost, and there is no other camp left to which the name of Mediolanum will apply. The rev. gentleman furnished each member with a map and plan of the camp and a printed description, so that his remarks were the more easily followed. The drive was resumed to Heleigh Castle, where, after a very stiff climb to reach the top, Mr. Daltry read a paper upon its history. There is but little left of the castle, a few fragments of masonry here and there, some walling of what are called cellars, showing the springing of some stone groining, and a portion of a round bastion tower and the well. The castle was a Saxon stronghold in the rising in Mercia in 1067-8, afterwards the Normans probably strengthened it, until at length it was destroyed in Henry II.'s time, under the law for demolishing castles. Heleigh subsequently passed through various hands until it became the property of the famous Henry de Audley, who erected a castle on this site, the ruins of which can now be seen. Its last appearance in military history was in January, 1644-5, when the Parliamentarian Committee sitting at Stafford, as a measure of precaution, directed its destruction.

After luncheon at the Corbet Arms Hotel, at Market Drayton, carriages were taken to the British Camp, known as "Bury Walls," which was inspected. Very little indeed is known of the history of this camp, it was probably British, occupied later by the Romans, some coins and other articles of Roman workmanship having been found there. Not far distant are the ruins of the "Red Castle," another of the strongholds of the Audleys. Mr.

Phillips, of Shrewsbury, had written a paper dealing with its history, which was read by Mr. Dalry. The keep was circular, cut in the solid rock for about 40 ft., and continued upwards in masonry. The outline of the castle was an irregular parallelogram, about 500 ft. by 300 ft. The party returned to Stoke by train from Market Drayton. At the evening meeting the papers read were on "St. Chad, the first Bishop of Lichfield," by Miss Edith Bradley; on "The Charters of the Abbey of Burton-on-Trent," by Mr. de Gray Birch, Hon. Secretary; "On Ancient Tillage," by Mr. Thos. Blashill; and "A Bit of Lost History," by the Rev. W. Beresford.

Friday was another very long day, but the weather was more settled, though dull, and the party, under the guidance of Mr. Wells Bladen, the leader for the day, left Stoke by train at 8.10 for Uttoxeter, whence carriages were taken for the drive to Chartley Castle, which was very clearly described by Mr. A. Scrivener. Before the Conquest there is no record of the existence of Chartley. Mr. Scrivener had prepared a plan from actual survey and measurement, showing a mound, 60 ft. in diameter, to the west of the earthworks, which had a ditch from 80 to 120 ft. wide. This mound was undoubtedly artificial. Fifteen feet below this mound, and to the east, was a plateau of horse-shoe form, also with a ditch; and again to the east was another plateau of a somewhat circular form, likewise having a ditch. These earlier earthworks were taken advantage of when the castle was built early in the thirteenth century by the Earl of Chester. The remains of the castle are considerable, and consist of the lower portion of a circular keep, a curtain wall of considerable height running eastwards, in which are the remains of five towers with walls which were about 12 ft. in thickness, pierced with arrow slits. Between two of the towers, which stand closer together than the others, was the entrance gateway. The castle is rapidly falling into utter ruin, from want of a little careful preservation of the masonry, some parts of which are in a dangerous condition. The castle and estate of Chartley passed from the Earls of Chester to the Ferrers family and from them to the Devereux in 1450 by marriage. It was in the manor house at the foot of the hill close to the castle, that Mary of Scotland was confined for sometime, when being removed from Tutbury to Kotheringham.

Leaving the castle, the company drove back to Uttoxeter for luncheon, and afterwards took the train for Alton and inspected the grounds of Lord Shrewsbury's house of Alton Towers. The party here divided for a time, one part going with Mr. Lynam to visit the ancient British earthwork. On reassembling at the entrance gateway, the company took carriages for the drive to the ancient Abbey of Croxden. This abbey is a typical example of a Cistercian monastery of a late date, and is grand even in its ruin from the simplicity of its architecture and its beauty of ornamentation. The effect of the lofty lancet windows in the western gable, and elaborately moulded doorway beneath, could not fail to be appreciated. It is particularly interesting because showing a departure from the severe plainness of the earlier buildings of this order of monks. Taking up a position beside the west doorway, Mr. Lynam, with the aid of a large plan, explained the arrangements of the monastery previous to conducting the party round the ruins. The building dates from the early part of the thirteenth century. The whole of the abbey lands, he said, were once enclosed by a lofty wall, some portions of which remained. The cloisters were to the south of the church, the chapter-house being on the east of them, the entrance doorway and side arches still standing. This part of the cloisters had been vaulted, the springing stones still remaining; the other alleys had had lean-to roofs of wood. The plan of the abbey and conventual buildings can very easily be traced. Remains also exist of the abbot's house and infirmary. The high road now runs through the ruins over the site of the high altar of the church. Several stone coffins yet lie sunk below the surface of the ground in what is now an orchard. After partaking of afternoon tea at the Abbey Farm, by the kind invitation of Mr. and Mrs. Wood, the party re-entered the carriages for the drive to Checkley. A short time only could be devoted to the inspection of the three pre-Norman crosses in the churchyard; they stand together, and are similar in design to others in the county, having square-sided stems with panels and interlaced work. The rector, the Rev. E. Philip, said they represented the establishment of a religious or preaching station on that spot of a much older



date than the time of the church. It is said that St. Bertram, passing on his way to Stafford, stayed at Checkley, and had them erected, and as time went on a cemetery was formed around them, and they became the nucleus from which the present church had risen. The church is an interesting structure of Norman foundation, having been built by a Norman knight named Bec. The present building is of later date, and consists of a nave of four bays. The chancel is very long, and has four large windows on each side and a five-light east window, all of the Early Decorated period, and without foliation. The font is circular and Norman. The stalls are old and Late Decorated. There is an interesting monument to the family of Foljambe, date 1560. The last Abbot of Croxden, Thomas Chawner, is said to be buried here. The party had now to hasten away to catch the train at Totmanslow station for Stoke. At the evening meeting, Mr. C. H. Compton, V.P., read an interesting paper on Croxden Abbey, and Mr. de Gray Birch mentioned that in the British Museum there were two MSS. which contained the exact dates on which all Cistercian abbays were founded. Reference was made to the dangerous neglect of the ruins, both of the abbey and of Chartley Castle, which, if not speedily averted, would ensure their entire destruction. Dr. Phéné next read a lengthy and learned paper on "Some hitherto little-noticed Earthworks in Central Britain." There was also a third paper on "Borough Seals and Maces," by Mr. J. W. Tonks. The Chairman, Mr. Lynam, announced that, owing to the great distance to be covered in the programme for Saturday, it had been decided to abandon the proposed excursion, and to have a quiet day either at the Wedgwood Institute or in visiting some of the pottery and tile works in the town, and that the concluding meeting of the Congress would be held at his house, The Quarry, Harts-hill, in the afternoon.

On Saturday, at 3 o'clock, the members and friends and the local committee assembled in the breezy and spacious garden at Mr. Lynam's house at Harts-hill, where, under a large open-timbered roof which had once formed part of a church, the concluding business of the Congress was transacted. Mr. Blashill, V.P., presiding. After partaking of afternoon tea, a hearty vote of thanks was accorded to Mr. Lynam, and the company separated.

PROPOSED ARCHITECTURAL SOCIETY, PLYMOUTH AND DEVONPORT.—An effort is being made in Plymouth and Devonport to form a local Architectural Society on the suggestion of Mr. E. M. Leest, of Devonport. A meeting will be held at an early date to consider the scheme.

GATES, WESTON PARK, SHEFFIELD.—The entrance to the Weston Park, Sheffield, is being provided with wrought-iron ornamental gates from the Art Metal Works of Thos. Brawn & Co., Birmingham.

THE CAMBRIAN ARCHEOLOGICAL ASSOCIATION AT LAUNCESTON.

THIS year the Cambrian Archaeological Association departed from their usual custom of holding their annual meeting in Wales, partly because they had received a very cordial invitation from the Royal Institution of Cornwall to visit Launceston, and partly because they were anxious to have an opportunity of seeing the antiquities of Cornwall, or West Wales, as it was once called, which are so nearly allied to those of the Principality, more especially the pre-historic remains and the early Christian monuments.

About fifty members arrived at Launceston on the afternoon of Monday, August 12, and took up their quarters at the White Hart Hotel for the week. Although this hostelry is not of the twelfth century, it possesses a real Norman doorway, brought from the ancient Priory.

The situation of the town of Launceston is a very charming one, on the south side of the valley of the Kensey, a tributary of the Tamar. The great double concentric drum tower of the castle stands up high above everything on the top of a



Font in St. Stephen's Church, Launceston.

lofty rock. The market-place is on the comparatively level ground between the castle and the sloping hill-side behind, and the remainder of the town straggles down a marvellously steep incline to the bottom of the valley towards St. Stephen's, which is on the opposite side of the Kensey. Some of the old houses, faced with large green slates, are extremely picturesque, and in many respects not unlike those in Brittany. The chief beauty of Launceston is that the rural features have not been entirely obscured by bricks and mortar, nor, we are thankful to say, has the builder of Queen Anne villa residences yet desecrated this quiet spot with his unwelcome presence. The first excursion on Tuesday, August 13, was to Tintagel, nineteen miles west of

Launceston. This part of the coast, which was formerly rather inaccessible, can now be approached with comparative ease, since the extension of the London and South-Western Railway to Wadebridge. The party were conveyed by train to Camelford, and thence by carriage to Tintagel, stops being made *en route* to inspect Lanteglos Church and inscribed stone, Worthysale inscribed stone, and the inscribed and ornamented cross-shaft on Waterpit Down.

At Camelford, which is some distance from the railway-station, nothing was seen to interest the visitors except the weathercock of the town-hall surmounted by a camel, in reference to the name of the town.

The church at Lanteglos-by-Camelford (so called to distinguish it from Lanteglos-by-Fowey) is remarkable more on account of its secluded situation in a well-wooded valley than for any architectural merit it possesses. With the exception of Tintagel Church, almost all the churches seen during the meeting presented the same characteristics, namely, a nave and chancel of the same width, with an aisle on the south side extending the whole length of the building, and separated from the rest by an arcade of four-centred arches springing from monolithic granite columns, and in some cases a north transept; lofty western towers, with pinnacled and embattled tops, porches generally on the south side; cradle roofs with carved bosses; carved rood-screens and bench-ends; and fine Norman fonts.

In the Rectory grounds at Lanteglos were seen three granite Cornish crosses, devoid of ornament, and the Saxon pillar* erected by Elselth and Genereth to the memory of Elwyne. This, and the other monuments of a similar kind seen during the day, were ably described by the Rev. W. Iago, who made his remarks more easily understood by placing rubbings of the inscriptions side by side with the stones, thus enabling letters which were almost invisible on the stone to be read with ease.

A pleasant afternoon was spent in examining Tintagel Church and Castle. The former is a cruciform structure, preserving most of its original Norman features. The stiles at the entrances of the churchyard here and elsewhere in the district are rather peculiar, and consist of a passage paved with a sort of gridiron arrangement of granite bars at intervals of about seven inches apart, with a space between so as to catch and trip up any animals attempting to stray into the churchyard. At Tintagel the grid-stiles are double, with a block of masonry in the centre to rest coffins upon at funerals. On the top of one of these blocks the Rev. W. Iago discovered some years ago a Roman inscribed stone of the Emperor Licinius, now placed within the church.

Tintagel Castle owes its celebrity principally to its being the traditional birthplace of King Arthur, and to its extraordinarily wild situation, perched on the top of a slate cliff of variegated colour, and contorted formation undermined and hollowed out into caves by the sea in all directions. The walls of the fortress, although apparently not older than the thirteenth century, have been honeycombed by the weather till they can scarcely be distinguished from the crumbling rock of which they appear to form part. The castle is entirely devoid of mouldings, &c., by which its date might be accurately fixed. A full account of both castle and church will be found in Vol. I of Sir John Maclean's "Deanery of Trigg Minor."

On Wednesday the party started by carriage for Warbstow Barrow, eleven miles north-west of Launceston, visiting the churches of Lancaut, Warbstow, Trenglos, and Egloskerry on the way.

Warbstow Barrow is a large oval earthwork, defended by a triple rampart and ditch. It is situated between Launceston and the Cornish coast, being about five miles distant from the latter. Its height above sea-level is 800 ft., and the strategical position between the head of the valley of the Tamar and the coast must have been an important one in early times.

We have already described the general style of the churches in the Launceston district, most of which are built of granite, and have been entirely remodelled in Perpendicular times. Although there is a good deal of sameness in their architecture, yet there are hardly any of them that do not possess some detail or object deserving of notice.

The fonts at Warbstow and at Lancaut are almost identical, and of the same kind as those

* The Saxon word used in the inscription is *sythel*, which Mr. Iago translated as *family pillar*, the latter syllable being allied to the Greek *σπηλη*.



Sculptured Norman Tympanum at Trenglos, Cornwall.

at St. Thomas', Launceston, Altonern, and Jacobstow. These fonts are Norman, and have a large rosette on each of the four sides of the bowl, with a pair of serpents twined round it and human heads at each of the four corners.

At Trenglos and Egloskerry Churches are some sculptured Norman tympana, which were described by Mr. A. G. Langdon. An Elizabethan helmet preserved in Egloskerry Church excited the admiration of a member of the Kernoozer's Club who was amongst those present. He said that a dealer would probably not offer less than 60*l.* for it, and he therefore recommended that it should be better taken care of. He thought the best way of dealing with it was to hang it on a wrought-iron bracket, as had been done at Llanidloes, Llantrythid, and elsewhere, at his suggestion.

The entire day on Thursday was given up to the prehistoric remains on Dartmoor, which were explained to the members by the Rev. S. Baring Gould and Mr. R. Burnard, of Plymouth. The latter gentleman was also kind enough to provide the party with luncheon in a region so wild that it would have been difficult otherwise to procure any refreshment had Mr. Burnard not thoughtfully had it sent all the way from Plymouth. Dartmoor was approached from Tavistock, and the furthest point reached was Grimspound, nearly 30 miles to the eastward.

The megalithic remains on Dartmoor are tolerably well known to antiquaries. The only new light that has been thrown on them is by means of the excavations made by the Rev. S. Baring Gould and Mr. R. Burnard for the Dartmoor Exploration Committee of the Devonshire Association for the Advancement of Science. The general results they have arrived at are that the hut circles were undoubtedly the dwelling-places of a neolithic people, in so low a stage of civilisation that they seem to have been unacquainted with the use of pottery, or spinning gear, or querns for grinding corn. It appears probable that the stone circles, alignments, cist-vaults, menhirs, and other sepulchral remains were the work of the same race.

The only effort at primitive architecture seen on Dartmoor, besides the rude stone huts and the walls of Grimspound, was the cyclopean bridge at Post Bridge. This, however, is more likely to be Mediaeval than prehistoric. It has three spans, the centre one of 10 ft. and the two others of 12 ft., the width of the piers being 2 ft. The largest slab of granite used in the construction of the bridge measures 15 ft. long by 7 ft. wide by 1 ft. thick.

The excursion on Friday was by carriage to the Cheesewring, nine miles south-west of Launceston, stops being made at Northhill, Lewannick, and Southhill Churches.

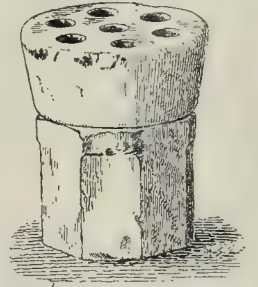
The Cheesewring is a granite tor of natural formation, resembling five enormous cheese-shaped blocks, carefully piled up on the top of three smaller ones by some Cornish giant of old. Geologists maintain that the whole is really one mass of rock, and its remarkable appearance is due solely to the disintegrating effect of the weather. Whether the Cheesewring ever served as a rock idol to the ancient inhabitants, as Borlase asserts, it would be difficult to prove. At any rate, it is in the immediate vicinity of a large fort with walls of rubble stonework, like those of Carn Goch in Carmathenshire, which crowns the summit of the hill, and the Hurlers stone circles and the Trethevy Cromlech are not far off. In a cist-vault, still visible within a cairn, between the Cheesewring and the Hurlers was found in 1837

a gold cup, probably belonging to the Bronze Age, of the bullion value of 10*l.*

Immediately outside the rampart of the stone fort above the Cheesewring is a large natural block of granite hollowed out by the weather into a rude seat called the Druid's Chair. It is said that whoever sits in it is destined shortly either to become a poet or go mad—in fact, the Laureateship or Colney Hatch! The whole neighbourhood of the Cheesewring has been completely spoiled by quarrying and mining operations.

Just below the Cheesewring is a rude hut like a cromlech, formed of large slabs, of granite, which goes by the name of *Daniel Gumb's House*. It was inhabited in the last century by an eccentric individual who lived here, and brought up a family in a state of primeval savagery. One of the jambs of the doorway is inscribed D. Gumb, 1735, and on the top of the roofing slab is an incised figure of the diagram of Euclid's forty-seventh proposition of the first book, but with the sides of the right-angle produced so as to form two sides of a fourth square in which the square on the hypothenuse is inscribed. The length of the sides of the squares are 6, 8, 10, and 14 in. respectively. The proportions of the three sides right-angled triangle are thus 3, 4, and 5, giving the well-known method for setting out a right-angle.

At Lewannick Church are the only two Ogam inscribed stones yet found in Cornwall. The



Cresset Stone in Lewannick Church.

discoverers, Mr. A. G. Langdon and Mr. F. H. Nicholls, were both present, and the former delivered an interesting discourse on the inscriptions. Lewannick Church is dedicated to St. Martin, a Gaulish Saint.

At Southhill Church is another very early inscribed stone bearing the Chi-Rho monogram of Christ upon it. This, and the dedication of the church to St. Samson (probably of Dol, in Brittany), indicates that there was a Christian establishment at Southhill, possibly in the fifth or sixth centuries.

The Norman font at Southhill was one of the most perfect seen during the meeting. It is of the same type as the one at Bodmin, with four shafts at the corners terminating in human heads at the top. The hemispherical bowl is decorated with a conventional tree, a dragon, and a pair of beasts, repeated on the two opposite sides. It is made of a beautiful white stone.

The font at Lewannick is octagonal, and exhibits a great variety of geometrical incised patterns on each of the panels. The cresset stone at Lewannick is also a very rare object.

The morning of Saturday was devoted





THE CHURCH
NEW FARM



SOUTHAM
THE MANOR FARM
GARDEN FRONT

SKETCH



ENTRANCE

HOUSE AT
CHAPLTON ABBOTS.

Aug 7 1895

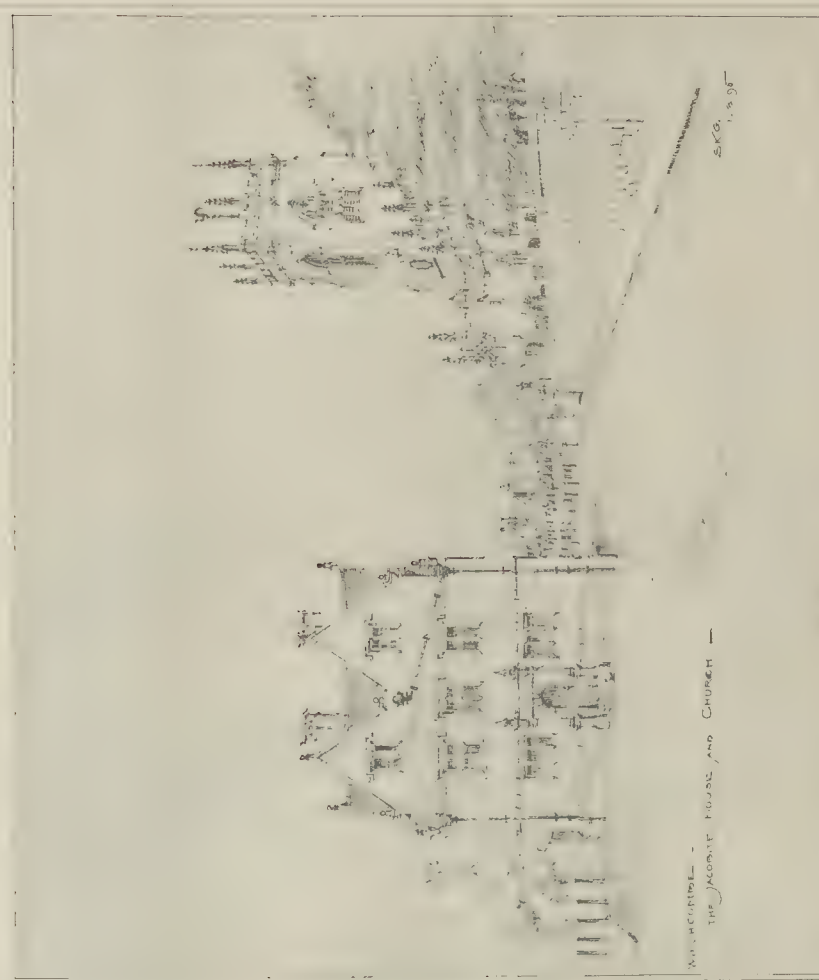


ST. MARTIN'S

A VIEW OF THE HOUSES FROM THE GARDEN



THE BUILDER, AUGUST 24 1895



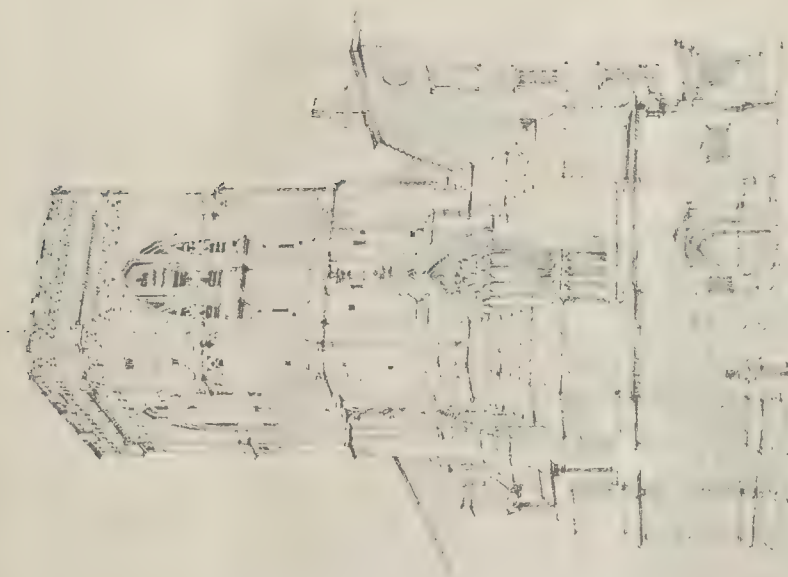
W. H. MURPHY -
THE JACOBITE PALACE AND CHURCH - I

S.K.O. 1.098



A HOUSE
AT GLOUCESTER

O.K.
July 1895

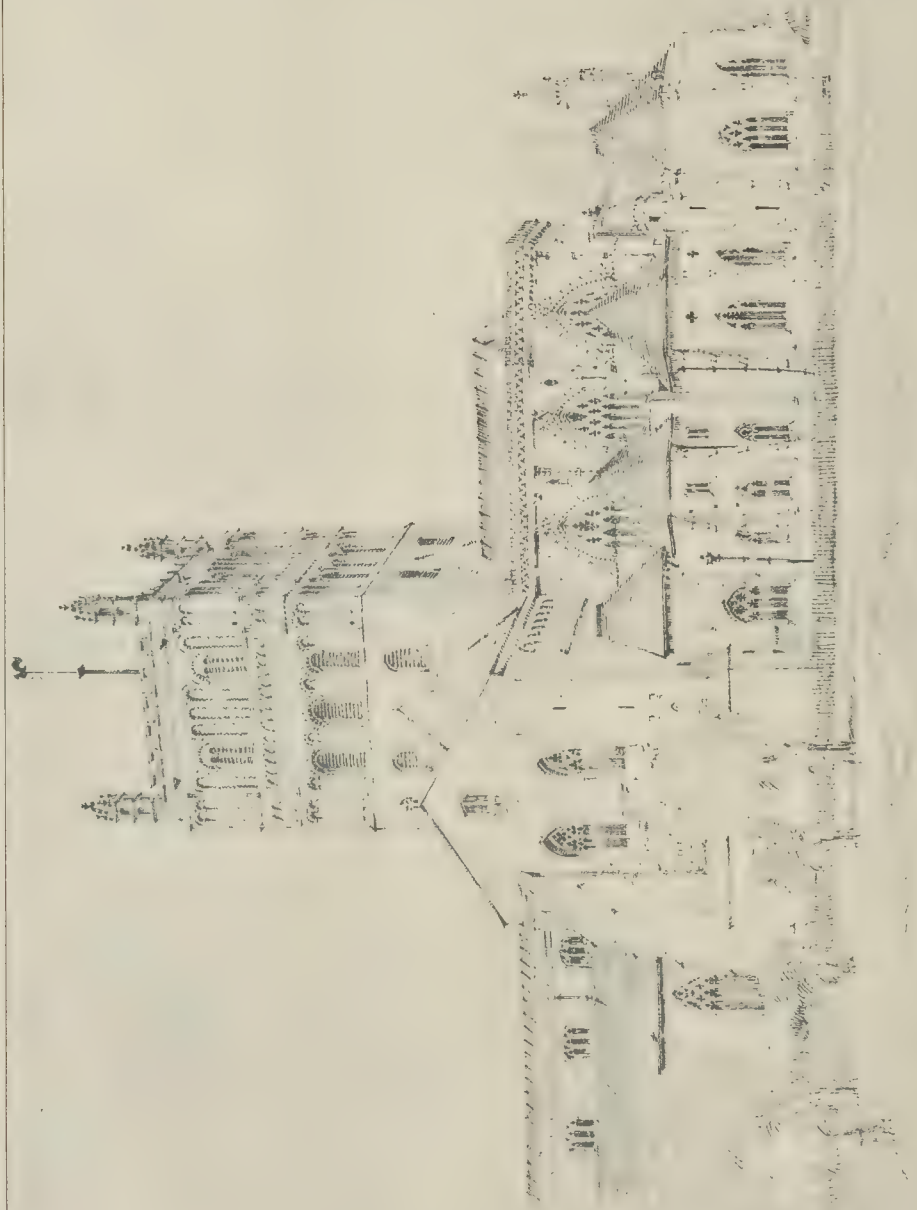


THE TOWER AT THE GLASS
GLOUCESTER

ARCHITECTURAL ASSOCIATION EXCURSION, 1895
SKETCHES ON THE LINE OF ROUTE



THE BUILDER, AUGUST 24, 1895.







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ARCHITECTURAL ASSOCIATION EXCURSION, 1895.
SKETCHES ON THE LINE OF ROUTE

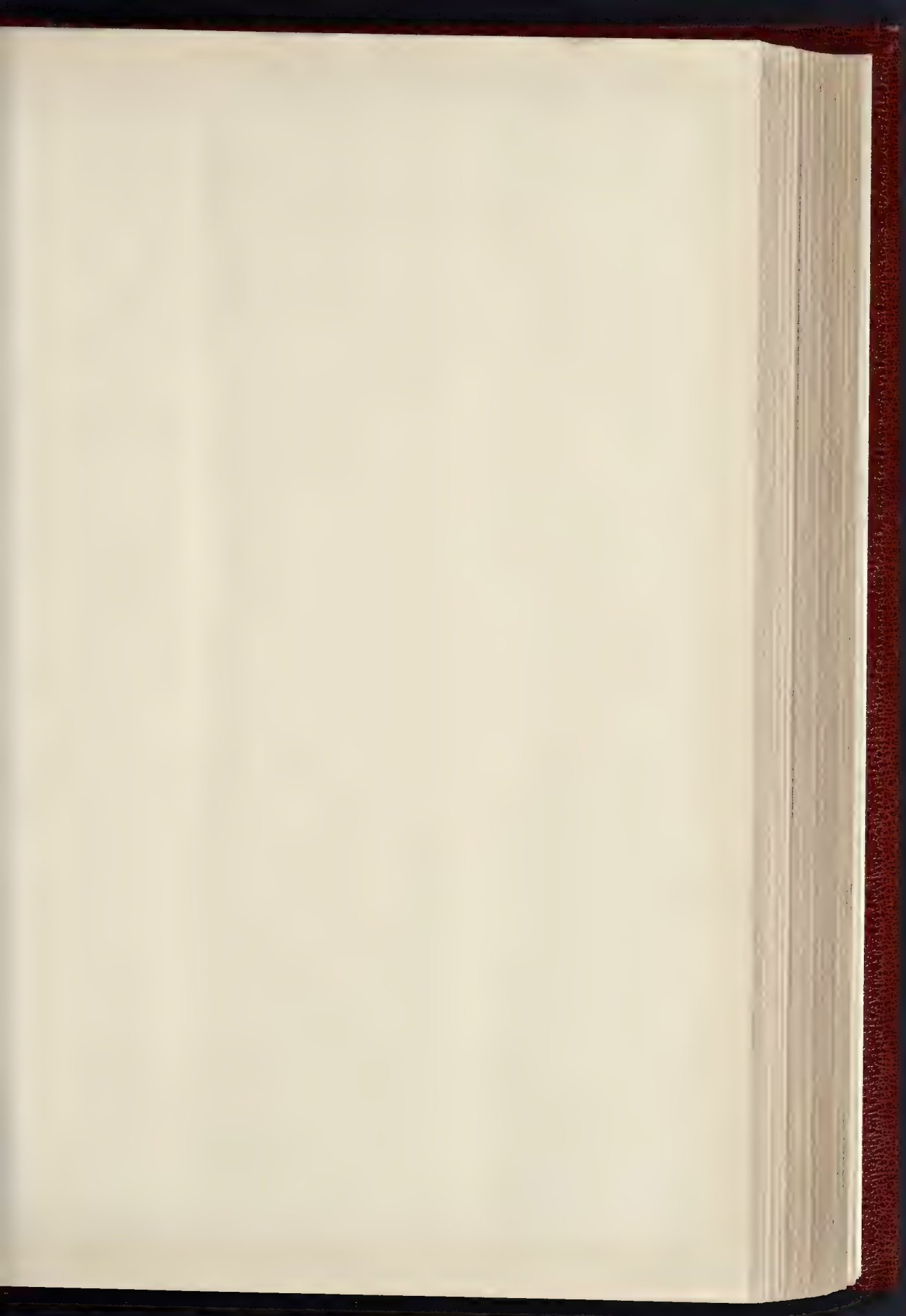


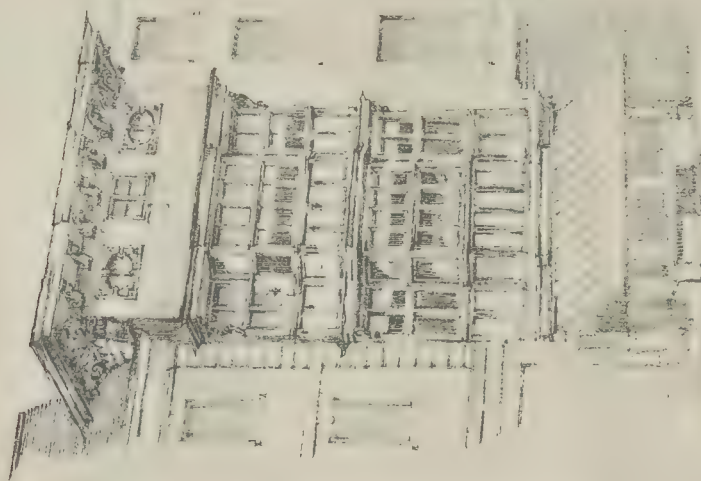
ARCHITECTURAL ASSOCIATION EXCURSION, 1895
 SKETCHES ON THE LINE OF ROUTE.



THE PHOTOGRAPH OF THE CHURCH AND THE CHURCH

ARCHITECTURAL ASSOCIATION EXCURSION, 1895
SKETCHES ON THE LINE OF ROUTE





House
at Tewksbury

2 x 15
30 x 15



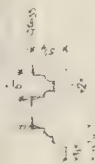
House
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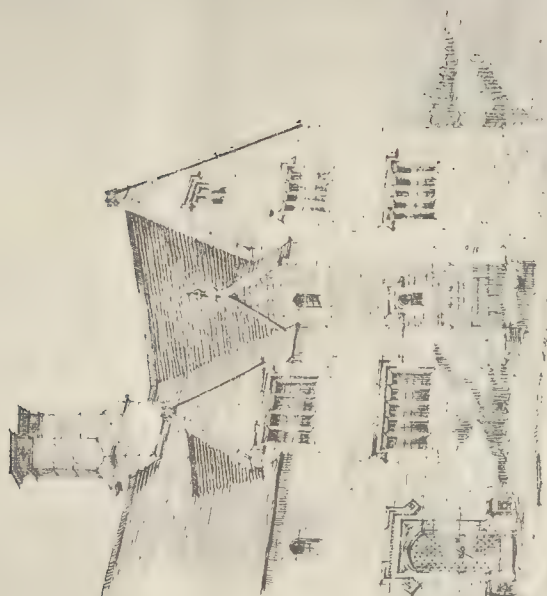


SKETCH
2. 18. 95

AT BROADWAY



18. 2



CHURCH / BROADWAY

A HOUSE AT BROADWAY

SKETCH
2. 18. 95

ARCHITECTURAL ASSOCIATION EXCURSION, 1895
SKETCHES ON THE LINE OF ROUTE

castle and churches of Launceston, Mr. O. B. Peter, F.R.I.B.A., acting as guide. A description of these we must refer our readers to Mr. Peter's "History of Launceston." St. Stephen's Church are two slabs of sculptured into the east wall of the chancel, one representing Christ holding a book and giving benediction, and the other the Virgin and Child. The style is very archaic, and has a strong affinity with the art of the Saxon and Norman ivories than with Norman sculpture. At the evening meeting on Friday a very fine set of drawings of Cornish crosses was exhibited by Mr. A. G. Langdon.

The programme for the Launceston meeting was arranged by Mr. J. Romilly Allen and Mr. G. Langdon, and admirably carried out by Mr. O. B. Peter and Mr. T. C. Reed. The occasion on which the time-tables drawn up each day were not rigidly adhered to was on Cheesewring excursion, when the Tretheley meach was put in as an extra, with the result that the party arrived home too late dinner, and the evening meeting had to be postponed. The weather was exceptionally fine throughout the week, and the members returned with a lively recollection of the hearty hospitality of the West of England, the evergreen beauty of its scenery, and the extraordinary interest of its antiquities.

Illustrations.

ETCHES ON THE ROUTE OF THE ARCHITECTURAL ASSOCIATION EXCURSION.

Our illustrations this week are from sketches prepared by Mr. S. K. Greenlands, and are given in connexion with the annual excursion of the Architectural Association. Some of the buildings illustrated are referred to in our descriptive report of the excursion last week. The other buildings illustrated are commented on in another page in our account of the excursion.

Correspondence.

To the Editor of THE BUILDER.

PRESENTATION OF ARCHITECTURE AT THE ROYAL ACADEMY.

SIR,—Illness has prevented me from answering your letter before.

I think it is of the utmost importance that the London public should have the chance of seeing accurate representations of all the good architecture that has been completed in the country in the preceding year. Even with so small a space as that at the R.A.'s disposal, I think it can be done by only admitting photographs on which a small plan is shown, and that no other works are admitted into the Architectural Room, where there were space for a model or two of things just completed. I recommend photographs taken from the building itself at the level of the footpath, so that the actual appearance of the building, from the place it is usually seen, be ensured.

There is ample space on the three walls of the hall on the level of the galleries, which is now left blank, to hang such competition drawings and designs of buildings, and such exteriors and interiors as much of their charm to colour, as are sufficient, with the Architectural Room, to constitute a proper architectural exhibition. If there is sufficient space left, such drawings as those which usually fill the Architectural Room should be hung too.

G. ARCHIBOLD.

CLEVE CHURCH, GLOUCESTERSHIRE.

SIR,—In the report of the Architectural Association Excursion, given in your last issue, there is a description of Cleeve Church. In a note on the fine west gallery, the writer says:—"We merely hope that the mad idea now entertained of shifting its position to a meaningless and utterly inappropriate location in the north aisle will never be realised."

The repairs, &c., of the church have been, for the last two or three years, in my hands. At the meeting of the Restoration Committee, the most urgently pressed was the removal of the gallery. I stopped the idea for the time being, but if it were touched I should retire, and the Committee must find another architect. In

all probability the church will be under my superintendence for two or three years more. After that, very likely the gallery will disappear, and the "vandal architect" will no doubt get the blame, as he often does for what he had no hand in.

HENRY PROTHERO.

P.S.—I am inclined to think that the alternate piers of the nave were removed in 1700, but that the gallery is some eighty years earlier than that date. There was once one like it in St. Mary's, Cheltenham.

"ON COMMON COLOURS."

SIR,—I have just seen Mr. Laurie's article in the *Builder* on the above subject, and as it appears to me a very good example of the tendency of such articles on colour to "make confusion worse confounded" by blaming others for not doing something which is, after all, left undefined, I ask permission to say a few words by way of comment.

Mr. Laurie is very angry that London decorators do not use "the patent white leads." It is "simply the outcome of ignorance" that they do not do so. But whose or what "patent white lead" is it that has gathered to itself all the virtues and none of the vices of the ordinary best white lead? Mr. Laurie stops short at the critical moment, and only refers us to "analytical chemists" and the "light of science," and goes on to say that every industry upon which that light has been turned "has enormously developed and improved"; and he instances "the art of dyeing," of all others, as "revolutionized by the work of the scientific chemist." It has, indeed; so much so as to constitute rather a warning than an example. I do not think Mr. Laurie's instance will greatly encourage decorators to appeal to the scientific chemist; and it is certainly remarkable that the strongest argument against doing so is to be found in the early part of his article, where the ingenious person in question is shown not only as inventing the aniline dyes, (which have so developed and improved the art of dyeing), but as applying these dyes to pigments. As far as my own experience goes, the only absolutely certain thing about the consultation of the analytical chemist is the fee.

Mr. Laurie will be glad to know that some attempts have been made, under the auspices of the Painters' Company, to impart a little practical knowledge in the simpler chemical properties of pigments, in the technical classes for painters. It would be futile in such classes to offer more than very elementary facts; but such facts at least put the intelligent mind on the alert. It is, however, worse than useless to deal in vague generalities. If Mr. Laurie has some definite preparation to recommend in place of white-lead, why not say so?

I must conclude by a word of apology and excuse. Mr. Laurie mentions that his letter, addressed to the President of the Conference on Technical Education for Painters (held about two years ago) was never acknowledged. This was a serious oversight, which he will forgive on learning that the President was taken seriously ill the day or so before the first meeting, so did not preside. He was

J. D. CRACE.

COMPETITIONS.

INTERMEDIATE SCHOOL, PEMBROKE.—Fifteen architects have sent in plans in the competition for the Pembroke Intermediate School. The Governors have so far made no selection, and it is probable that no definite decision will be arrived at before the next regular meeting of the Governing Body, which will be held on September 11th next.

SCHOOLS, GUERNSEY.—The St. Pierre-du-Bas (Guernsey) Parochial Committee have selected the designs sent in by Mr. Frank Whitmore, architect, Chelmsford, for these new schools, and the same have been approved by the States Committee.

DURHAM COUNTY BUILDINGS COMPETITION.

The following gentlemen, who were competitors in the Durham County Buildings Competition, have signified their intention of signing the protest addressed to the Durham Council, a copy of which we published last week. The Hon. Secretaries to the competitors, Messrs. Philip Tree and Ivor Price, will be glad if all our readers who were competitors will send them their names and mottoes without delay, so that the list may be completed and forwarded as soon as possible.

HENRY T. HARE.

GIBSON & RUSSELL.

TREADWELL & MARTIN.

THOMAS DAVIDSON.

PRENTICE & BOLTON.

NIVEN & WIGGLES.

WORTH.

MALCOLM STARK & ROWNTREE.

W. A. PITE & GERALD

HORSLEY.

GROILL & MINTY.

H. W. WILLS.

CLARK & HUTCHINSON.

PHILIP TREE & IVOR

PRICE.

ARNOLD & NICHOLSON.

H. R. APPRELBEE.

The Student's Column.

METALS USED IN BUILDING.—VIII.

ALUMINIUM—(continued).

A GREAT deal of misconception exists as to the special properties of the metal aluminium, and much erroneous data has been published concerning it from time to time. One account speaks of it as having "no strength," and that it is as "soft as lead"; on the other hand, "castles in the air" are too frequently built of the metal. It may be well, therefore, to give the following general summary of its properties, so far as concerns our present inquiry, compiled from various sources, but based on the researches* of Mr. Alfred E. Hunt. The properties of aluminium are:—

1. Its relative lightness. The specific gravity of pure aluminium in the cast state is 2.58; when subjected to great pressure, as in being made into thin sheets under chilled rolls, its specific gravity increases to 2.7. But even this is very light for a metallic substance. For instance, if we take cast aluminium as the unit, wrought-iron is 2.90 times heavier, structural steel 2.95 times, copper 3.60 times, brass 3.45 times, nickel 3.50 times, lead, 4.80 times, gold 7.70 times, and platinum 8.60 times heavier. The majority of the woods used for structural purposes are about one-third as heavy as platinum.

2. Its ability to resist corrosion as compared with many other metals—aluminium not being acted upon at all by sulphur fumes, and being very much more slowly affected by moist atmosphere than most metals. The presence of much silicon in aluminium materially detracts from its power to withstand corrosion due to atmospheric influences; metal with from 4 to 5 per cent. of silicon very soon collects a thick coating of oxide upon it. Pure aluminium is practically not acted upon by either boiling water or steam.

3. Its extreme malleability; pure aluminium is only exceeded by gold and silver in this respect. It is very ductile; sheets of it are rolled down to .0005 in. in thickness, and may be beaten almost as thin as gold leaf.

4. Its easy casting qualities.

5. Its high specific heat and heat conductivity.

6. Its relatively-high electrical conductivity; pure aluminium has no polarity and the metal in the market is absolutely non-magnetic.

7. Its high tensile strength and elasticity, when weight for weight of the metal is compared with other metals.

8. The valuable alloys it makes with other metals.

The physical properties of aluminium embraced in the paragraphs headed 5, 6 and 7, will be more conveniently dealt with when treating of the strength and conductivity of metals in general. In regard to paragraph 8, that will be considered under alloys.

So much for the leading properties of the metal; let us now see how they are applied. On the score of its lightness aluminium is finding new uses almost daily. It is employed in the reciprocal parts of many forms of machinery where the momentum is to be overcome; also for valves, air brakes, and the like. In view of the circumstance that it is not acted upon by steam or boiling water it is being used to good advantage for "packing" in steam connexions. As yet, aluminium sheeting has not been extensively employed for roofing purposes, which circumstance is no doubt due to its price being somewhat higher than copper or "lead-compo"; every year sees it getting cheaper and cheaper, however, and there is a general consensus of opinion that the date is not far distant when the metal will be very largely used for roofing. Sea water has but little effect on aluminium, and in this respect the metal behaves much better than copper; it has been ascertained, however, that barnacles are extremely fond of it, and the metal would have to be specially prepared to enable it to be placed to the best advantage in sheathing for ships. For structural purposes under water it has been successfully used, and Mr. Hunt remarks (*Op. cit.*, p. 243) that it is standing the effects of time and corrosion much better than wrought-iron or steel, or even cast-iron under similar conditions. Aluminium is being employed in the United States in connexion with masonry foundations, in consequence of its non-corroding properties. In view of the fact that it stands so high in the series as an electro-positive metal, and that when in contact with other metals it may be subjected to corrosive

* "Mineral Resources of the United States for 1892," p. 241; and many other publications.

solutions, and galvanic action be thereby established at the expense of the aluminium, it is absolutely necessary to avoid such contacts in designing work.

Aluminium leaf, beaten extremely thin, has been much used for decorative purposes during the past few years, and from its close resemblance to silver foil has unquestionably been surreptitiously substituted largely for the latter; the student is specially cautioned as to this. The difference is easily made out. Thickness for thickness and size for size, the silver foil is nearly four times heavier than the aluminium foil. The respective specific gravities are thus, of course, widely different. Notable examples of the use of aluminium-leaf for decorative purposes may be seen in many leading buildings on the Atlantic slope of the United States, especially in New York; and it may be observed that the "Transportation" building at the World's Fair, Chicago, was decorated with it. Practically, all the minor artistic efforts in that building were made upon a base of thin beaten aluminium-foil. Oil-colours can be safely applied to its surface. In Germany, aluminium is rolled into tubes, by what is known as the "Mannesmann process," this branch of the industry alone being on an extensive scale.

The use of the metal in casting various objects constitutes one of the largest demands for it on the market, but we need not go into that phase of the subject. By reason of its non-magnetic properties it will in future be greatly employed for the manufacture of certain electrical appliances; already the consumption is not small on this head. In reference to special pieces for constructional work it may be noted that angles, plates, and channels and other sections have recently been placed on the market. It is rather an open metal for its texture, so that an increase in thickness over the ordinary formula should be given in designing such things as cylinders, or where much pressure would be brought to bear upon it. Aluminium slate pencils are gradually superseding ordinary forms of those useful articles,

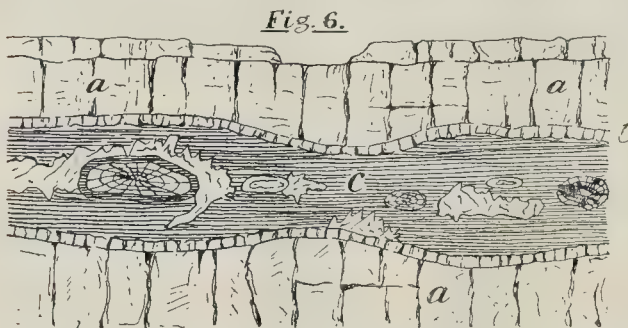
gives off fumes of hydrofluoric acid, which is used in etching glass, &c. In reference to corundum and emery, when ground and sifted the powder is extensively used for polishing hard substances, as in emery paper, emery wheels, and so forth.

MAGNESIUM.

This is barely worth mentioning in connexion with building, its only use for us being in the manufacture of screws for certain purposes. The threads made of this metal are sharper and more exact, as a rule, than those of aluminium. It is a silver-white substance and burns with a dazzling white light. Magnesium is not found in a native condition, but is procured artificially from the chloride. It does not oxidise in dry air. Magnesite, the carbonate, is usually associated with serpentine.

BARIUM.

Barytes and Witherite are the chief sources of this metal. The former, known also as heavy spar, is sulphate of baryta (baryta=65 per cent.), and occurs in rhombic prismatic crystals, or massive, granular, and staccate. It is mostly colourless, or of a brownish tint. Barytes is found in many mining districts, and is usually associated with galena and other metallic ores. Derbyshire, Staffordshire, Cumberland, and Cornwall have yielded large quantities of the mineral. Its principal use is as a pigment. In the first-mentioned county the variety of heavy spar in requisition is the amorphous, or earthy, form, known as "caulk"; the crystalline barytes called "boulder," or tush, is of less value, and when of a red tinge, as often happens, is rejected altogether. "Caulk" is used in the manufacture of white paint; the various kinds are ground very fine by being passed through successive mills, and are then allowed to settle; it is then bleached, washed, cut up into cakes, and dried. At many of the mines the only work now being done, and that on a small scale, is the picking and washing out of "caulk" from the old hillocks. The following diagram* (fig. 6) will



Section of mineral vein with barytes and fluor spar, Derbyshire (Blue John Mine, Castleton).

a=Limestone. b=Blue fluor spar. c=Mixture of clay, yellow fluor spar, and barytes.

especially in America. As a matter of general interest we may also note the employment of the metal for sounding-boards and stringed musical instruments. The American authority alluded to is responsible for the following statement in reference thereto, which, however, we are not able to control. He remarks that aluminium produces a more sonorous and pleasing tone than the wooden ones in common use. It differs from other metals in the character of its "metallic" sound. "There is an elasticity capable of sympathetic vibrations uniformly throughout a wide range of tone pitch with the metal, besides the other qualities of incombustibility, impermeability to moisture, and comparative freedom from liability to injury, such as splitting, which renders it far superior to wood for sounding-boards."

We may now consider the value of aluminium ores other than in the production of the metal. Bauxite is used in the manufacture of various kinds of paper, is essential in certain systems of decolorising sewage, in fixing the colours of earthenware baths and the like, whilst firebricks of a highly refractory nature are made from it, and it yields good alum, though this latter is prepared mostly from shales and alunstone. Cryolite is employed for making soda and alumina salts, as well as in the manufacture of a white porcelainous glass (Rutley). Wavellite, hydrous phosphate of alumina, when heated with sulphuric acid

be of interest as showing the manner in which barytes occurs in Derbyshire.

Witherite crystallises in the rhombic system, is white or yellowish-grey in colour, its chemical composition being carbonate of baryta (baryta 77 per cent.). A white used in water-colour painting is prepared from this mineral.

In addition to its use in making up paints, the compounds of baryta are employed for the adulteration of white lead, though it renders the lead pigment more permanent, as by diminishing the quantity of carbonate of lead the tendency for the paint to sulphurise is lessened.

GENERAL BUILDING NEWS.

ASYLUM BUILDINGS, GARTLOCH.—On the invitation of the City of Glasgow District Lunacy Board, the members of the Glasgow City Parish Council visited, on the 8th inst., the new asylum buildings in course of construction at Gartloch. The pavilion system of arrangement has been adopted, and the buildings are divided into two distinct parts— asylum and hospital. Four blocks are given off for the asylum, the accommodation for the male and female patients being separate, and each block is connected by means of corridors with the central or administrative department. This department consists of a large dining-hall, kitchen,

sculleries, dairy, general stores, and over the dining-hall there is a large recreation-hall. The official block is situated to the north and is flanked by two towers rising to the height of 130 ft. from the ground. In this block are situated the board-room, doctors' room, waiting-room, &c., and sleeping accommodation for attendants. Each block is divided into two wards, with dormitories above. Workshops are placed on the male side, while on the female side there is a laundry. In the hospital block accommodation is given for five classes of patients, there being wards for observation, for old and infirm, for acute and noisy, for sick and invalid, and for infectious cases. In addition to the asylum, a chapel and a mortuary have been built, and a large firm is in course of erection. Messrs. J. Thomson & R. D. Sandilands are the architects.

CHURCH, INVERNAID, STIRLING.—A church has just been erected near Invernaid, in the northern portion of the Parish of Buchanan. The church is built from plans prepared by Mr. Thomas Leadbetter, architect, Edinburgh. The stone—blue whinstone—was quarried from the rock in the immediate neighbourhood.

RESTORATION OF STOKE PRIOR PARISH CHURCH, WORCESTERSHIRE.—The old parish church of Stoke Prior has just been restored. Mr. J. L. Pearson, R.A., prepared the plans, which have been carried out by Messrs. Cornish & Gaymer, of Northampton. The church, as the *Birmingham Gazette* says, consists of a chancel 43 ft. long and 13 ft. wide, a nave 57 ft. long and 19 ft. wide, north and short south aisle, with chapels at the east end of each, dedicated to St. Catharine and St. Mary, a small vestry or sacristy east of St. Catharine's Chapel having a room or cell over it; a new vestry, with a new porch on the north side, and a new porch on the south side. A considerable portion of the church is of early twelfth-century work. Most of the walls are of that period, but windows of later date have been inserted from time to time. In the sacristy there is an old oak chest, the top of the solid trunk of a tree, the room being the original one, as may be conjectured. The doorway is in the wall on the west side of it, but there is no means of access to it. It is generally supposed to be a cell. Towards the west of the chancel there are arches opening north and south into the two chapels. St. Catharine's, on the north, contains a dormer window of Early Decorated date, also a small Norman window about 22 in. in height. This, as well as the steps up to the rood-loft, have just been opened out, having been formerly built up in the wall. The nave has five bays on the north side of simple Norman character of an early date. The columns, capitals, and bases are circular, and the arches are of the twelfth century. The bases have been removed except that of one respond. The interior wall of the north aisle has been rebuilt, the old stones being used as far as they would go. The remains of a Norman doorway were found in this wall, the door step being 14 in. below the modern level of the floor, while the Early English level, to which the floor has been restored, was 9 in. below. A large stone with two crosses chiselled on the surface, exhibiting what are probably the original consecration crosses. Mr. Pearson has inserted in this wall three square-headed windows of three lights. The two arches from the nave into the short south aisle "are very fine examples of thirteenth-century work, made solid, and pointed; the spire has been covered with oak shingles, and its defective timber replaced; the parapet of the tower has been restored; a ringing chamber has been constructed, a new vestry has been built on the north side with a heating vault beneath; and a new porch on the south; the floors have been lowered, concreted, and relaid with blocks and tiles; the uncomfortable seats have made way for chairs, a new pulpit, heating apparatus, and lighting fittings have been provided; the provision of oak framed doors with wrought-iron hinges, remodelling of the west end, new roofs, and ceilings throughout the latter chiefly of panelled oak; new gas and lightning conductors, drainage, and other repairs." CHANCEL, SCREEN, DOWNHAM, CAMBRIDGE.—The ancient church of St. Leonard's, at Downham, has just received an offering in the shape of a carved oak chancel screen. It is of fifteenth-century character. There is a wide central doorway, the line of demarcation being marked by gates of hammered metal work, designed like the screen itself, by Mr. Thomas Garrett, of Shepherd's Bush, W. The sides are panelled and traceried, and the transoms are carved. There are two open bays above these, on the north and south sides respectively of the doorway. Over again is the main cornice. The whole is surmounted by a pierce

* "The Carboniferous, &c., Rocks of North Derbyshire (Mem. Geol. Surv.), 1887," p. 162, fig. 34.

sting. The screen is of English oak, and it has been made in the studios of Messrs. Harry Hems & Co., Exeter. **ALTERATIONS TO THE ROYAL SAULS' HOME, DEVONPORT.**—There has just been erected at the Royal Sauls' Home, Devonport, a Portland cement tank in substitution of the old wooden structure. Messrs. Healy & Sons were the contractors for the work, which was designed by Mr. Henry George & Co., of Devonport.

RESTORATION OF CHURCH, NORTON-SUB-HAMPTON, SOMERSETSHIRE.—The re-opening of the church of St. Mary's Church, Norton-sub-Hampton, took place recently, when the new font and peal of bells were dedicated. The restoration was made necessary by the fire that burnt out the whole of the interior of the tower a year ago, including all the lead and work, the peal of bells, the screen, and a fifteenth-century screen, &c. Besides considerable damage was done to the roof of the church, the font, the seating, and organ. The peal of the inside work of the tower is now stated. Six bells are now provided in place of old peal of five, and a clock has been obtained from Messrs. Smith & Co., of Derby. The peal of the stone-work has been repaired as well as, and four new additional detached pinnacles have been added, originally provided for, but not put up, on the centre of each face of the tower, rising on the old gargoyles. These pinnacles are a gift of the Ham Hill Stone Company. The tower windows are now filled with new iron panelling, in place of the old boarding. The west window is glazed with Prior's Mediaeval flow was made by Mr. Drake, of Exeter. Under the west window is the doorway for which new oak has been given by Mr. F. Nicholls. The screen to replace the old one in the tower arch, forming the vestry, is not yet finished. A vestry has been formed at the west end of the aisle. The floor of this part is of black and white marble, and the font is of Derbyshire alabaster. The ceiling of the church was very much damaged by the fire, and it has been replaced throughout in the directions of the architect by Mr. Howe, of Exeter. Mr. H. Wilson, of London, was the architect for the restoration. The bells have been fitted by Messrs. Warner & Co., of London. The organ has been restored by Messrs. Griffen & Co., of Bath. On the east and west corners of the church have been placed of the same form as the immediate existing old ones. These have been made by Mr. W. Micklewright, of Norton, foreman Messrs. C. Trask & Sons. The whole of the work for the tower has been done by Mr. Joseph & Co., of Exeter.

RESTORATION OF THURBERGH CHURCH, YORK.—The dedication of the tower and spire of Leonard's Church, Thrybergh, took place on the 15th inst. The foundation stone of the work of restoration was laid in December, 1894. The architect was Mr. Hodgson Fowler, F.S.A., of Durham. The contractor, Mr. R. Snell, of Rotherham.

REPAIRS, LANCASTER.—The New Infirmary, Lancaster, is being erected from the designs and under the superintendence of Messrs. Austin & Co., architects, Lancaster. The various wards and other rooms are being warmed and ventilated by means of Messrs. E. H. Shorland's Patent Heater Grates.

NEW BUILDINGS, OXFORD.—On the 12th inst. the memorial-stones of the new school in connection with the William-street, St. Clement's, Bryan Chapel were laid. The new school, which is to accommodate some 150 children, will be built as to be divided from the chapel by folding doors, so that the chapel and school may be used as a large room, being at other times divided for the various Sunday services. The plans are by Mr. J. H. Kingsley, of the builder.

WORKMEN'S DWELLINGS AT PLYMOUTH.—The foundation-stone of some workmen's homes, at Rock, Plymouth, was laid by the Mayor (Mr. Law) on the 15th inst. The architects are Messrs. Hine & Odgers, the contractor being Mr. J. H. Kingsley.

NEW CHURCH AT PONTYPRIDD.—The new church of St. John on the Graig, Pontypridd, has just been opened. The architect was Mr. O. Evans, Pontypridd.

NEW BUILDINGS, NEWPORT MUSEUM.—New buildings for the Newport (Mon.) Museum have just opened. Messrs. Swash & Bain were the architects, and the contract was carried out by Mr. W. Richards. The building has an area of 30 ft., with a wide balcony running all round. It is built at right angles to the reading-room, and is entered directly therefrom. There is a hall of electric light, laid on by Messrs. Allam & Co., of Cardiff and London. The electric apparatus was supplied by Messrs. R. & Co., of Newport.

THE PAVILION, NEWPORT, MON.—The Newport Athletic Club recently invited designs for a new, and out of half-a-dozen submitted they selected that sent in by Messrs. Swash & Bain, of Newport. Tenders for the construction of the pavilion (which, it is estimated, will cost £1,000 to £1,200) are to be invited in the

course of a few days. The accepted design provides for a building in red brick, half timbered, with gables, in two stories, and a terrace sloping from the entrance to the ground, affording sitting accommodation for 400 members. The ground floor will contain the committee-room, the members' room, kitchen, store-room, and bowlers' room (the latter for future bowling-green purposes), as well as lavatory accommodation. On the first floor there will be a dining-room, 36 ft. 6 in. by 10 ft., centrally placed, on either side of which will be the dressing-rooms, one being allotted to members and the other to visitors. At the rear of both will be lavatories and shower baths. There will also be a verandah and balcony for the use of players. The pavilion will be erected in a diagonal position in the north-west corner of the ground.

SCHOOLS, DUBLIN.—The new schools in Whitefriar-street, Dublin, have just been completed. The building is 270 ft. long by 52 ft. wide, and it is three stories high. The purchase of the site and the erection of these schools will cost 8,000. On the ground floor are the galleries, class-rooms to be devoted to the infants. A teachers' dressing and retiring-room is also provided. An apartment is also set apart for this purpose in the upper stories in the boys' and the girls' schools. On the second floor will be the girls' schools. Glazed partitions divide the different class-rooms. All the wood-work is of red deal, with pitch-pine panellings. The third story will be devoted to the boys. Steam-pipes will be used to heat the building, and this part of the contract was carried out by the firm of Maguire. There will be separate playgrounds for the boys and girls. The contractor is Mr. James Mackey. The architect is Mr. J. L. Robinson was the architect, assisted by Father Hall. Mr. O'Connor completed the plans.

SANITARY AND ENGINEERING NEWS.

SEWERAGE WORKS AT WEST BRIDGFORD, NOTTINGHAMSHIRE.—The members of the West Bridgford District Council recently visited the scene of the operations connected with the new system of drainage adopted in behalf of that portion of the parish known as the Neutral Freehold, and Associates' Estates, and situate beyond Lady Bay Bridge. One portion of the main sewer, laid at Trent-boulevard, goes down the Melbourne-road and joins the Bridgford sewer near the flood-gates of the Grantham Canal. Another portion runs down Gertrude-road, a connexion being made at the south end. The two join and go under the Grantham Canal and across the fields in a southerly direction and empty into a new tank near the pumping-house. Here the sewage matter is pumped into the old rising main, and forced on to the sewage-farm some 600 yards away. The pipes are laid to convey it along the highest point of the land. Drain pipes allow the water to filter through the ground. The effluent runs into a series of dykes, which have been cleaned out and deepened, and through a syphon under the canal into the River Trent, the sediment being left to fertilise the land. There are altogether 182 acres for irrigation purposes on the farm. The tank, which is nearing completion, is 20 ft. long by 15 ft. wide, and 28 ft. deep below the engine-house floor level. The walls are of cement concrete, lined with blue brick in cement. The sewage passes through a wrought-iron grating before entering the tank. The pumps are of the three-throw ram type, and are manufactured by Messrs. Goddard, Massey, and Warner, of Nottingham. They will be driven by the engine now in use. The cost of the undertaking will be about 5,000. The work is being carried out according to the plans of Mr. W. H. Radford, C.E., the resident engineer being Mr. W. Holloway. The contractor is Mr. Thomas Smart, of Trent Bridge.

BERLIN SHIP CANAL.—The proposals for the Berlin ship canal, to which we have frequently had occasion to refer, are now finding favour since the successful completion of the North Sea-Baltic Canal. Several routes have been suggested, but the scheme known as the Finow and Oder route seems to be the most popular. The Tegel See, at Berlin, would be adapted as an inland harbour; and Stettin would be the terminal station, on the coast. Very few locks would be required, and the cost is estimated at 70,000,000. The proposed depth of the waterway is 25 ft., and the width at the water-line 190 ft. The River Oder would be canalised up to Greifenhagen, and the old Finow Canal partly used. The matter will probably now be finally decided in the coming Parliamentary Session.

JUNGFRAU RAILWAY.—At the last meeting of the technical commission which has the supervision over the construction of the Jungfrau Railway, a number of important decisions have been arrived at. The final surveys are to be made at once, and the works to be commenced in the spring. £1,000 will be given in premiums for the best proposals for working the line by electricity, designs for the rolling stock, &c. The speed to be attained on the line is to be 20 kilometres on gradients of 1/100, and 7 kilometres on steeper inclines. The steepest gradient allowed will be 1/50. The track will be 1 m. wide, and the width of the tunnels 3.20 m., and no curve on the line will have a smaller radius than 100 m.

BLACK SEA-BALTIC CANAL.—From Russia we hear that the proposed Black Sea-Baltic Canal will now probably be taken in hand. The construction of this waterway consists of cutting a new canal between the Rivers Berisina and Duena, and making the Rivers Dnieper, Duena, and Berisina navigable. The depth of the waterway is to be 29 ft., and its width is to be nowhere less than 120 ft. on the water-line. Riga and Cherson are to be the end stations of the Canal, and large harbour works will be necessary at these places. A number of inland harbours are also proposed on the route, of which the most important will probably be at Kiev. The number of locks will be small, but there will have to be at least seven expensive railway bridges and some twenty bridges for the great highroads. The cost of the works is estimated at 20,000,000, including comparatively small amounts necessary for the purchase of land. Five years will only be required for the work, as there are no difficulties for the engineers except the cutting through some treacherous bogs. When the Canal is completed, the distance between Riga and Cherson can be easily covered in seven days, at an average speed of six miles per hour.

DEEPENING THE MERSEY BAR.—According to the report on "the general state and progress of the dock-works at Liverpool and Birkenhead" for the year ending July 1, 1895, by Mr. G. F. Lyster, M.I.C.E., the depth of water on the bar has increased from 20 ft. with a channel of 1,000 ft. wide on July 1, 1894, to 23 ft. throughout a channel 1,500 ft. wide, with a leading-line through the centre of the dredged cut in which there is 24 ft. of water at extreme low water of spring tides. During the year 4,514,500 tons of sand has been removed by the two dredgers, and since operations were begun in September, 1890, 10,382,800 tons. Owing to the great length of time, 24 hours, taken to load the dredger Branker in certain positions on the bar, the proportion of silt pumped up with the sand being very large and passing over the side with the overflow water, the Mersey Docks and Harbour Board in February last decided to fit up the steam tender *Alarm* with an eroding or sand-disturbing apparatus, consisting of pumps and an arrangement of pipes to be lowered to the surface of the channel bed, and by means of powerful jets of water to stir up the silt that the ebb current might carry it into deep water. The work of fitting up the vessel is nearing completion.

FOREIGN AND COLONIAL.

FRANCE.—The English gallery at the Louvre has just received a new contribution in the shape of a landscape of Richard Wilson, a painter of whom we fancy very little is known in France.—A series of hot-houses for the supply of Paris have been commenced at Boulogne-sur-Seine; they will be surrounded by an architectural facade or decoration designed by M. Formigé, while in the central space will be a fountain decorated with a medallion modelled by M. Dagué.—M. Chas. Normand has just completed, in the Batignolles quarter, a chapel in a Romano-Byzantine style, in connexion with a Franciscan convent. The chapel is richly-decorated, and beneath the nave is a subterranean chapel in the form of a crypt.—The jury of the competition opened for a Hôtel de Ville at Asnières has awarded the first premium to Mr. Emanuel Garnier, a Government architect, and also Inspector of Works to the Paris, Lyons, and Mediterranean Railway Company. The second premium has been awarded to MM. Brésson, Désert and Beutz, of Paris; and the third to MM. Tronchet and Rey, also of Paris.—M. Gaudes has just completed the model of the monument, which is to be erected at Alais, to the memory of the romancer Florian. The statue of the poet is on a pedestal which forms a fountain, and which is decorated by two bas-reliefs recalling the principal works of Florian, combined with figures of animals and rustic symbols.—The jury in the competition opened at Saint-Maixent for a monumental funeral chapel has awarded the first premium to M. Delorme, architect, of Amiens, the second to MM. Barbaud and Babin, of Paris; the third to M. Giraud, of Eprenay.—The first premium in a competition for a monument to Carnot at Limoges, has been awarded to M. Clausade, sculptor, and M. Jules Godefroy, architect. The main design is of rectangular form; at the base is a seated figure representing France holding a flag; at the summit the statue of Carnot, "appuyé sur la constitution"; so runs the description in French, but how that incident is to be represented in sculptural form we do not gather.

GERMANY.—The Emperor has conferred a number of distinctions on the officials and engineers connected with the construction of the North Sea-Baltic Canal. The number and importance of these distinctions are quite unusual. Several distinctions have also been given in connexion with great opening ceremonies, and among these we notice one (Red Eagle, Class III.) for Herr Haller, the architect of the Hamburg Town Hall, in which the Emperor dined. The new Town Hall was illustrated in our New Year's number.—Judging from the local papers, there seems to be much dissatisfaction as to the management of the new North Sea-Baltic Canal, instead of having some thoroughly practical men

in charge of the traffic, the present managers are apparently theorists and admirers of red tape. A change in the officials is asked for.—The authorities have now decided to postpone the erection of the new Art Exhibition Palace which has been under their consideration, and for which Professor Ende prepared some interesting plans. The old exhibition halls at the "Lehrte" Station will again be used for next year's international show, but they will be thoroughly overhauled, and probably newly roofed in, as they are not quite weather-proof.—A statue to the late Werner von Siemens will be erected in front of the Royal Technical College at Berlin. The necessary funds will be voluntarily subscribed.—The prices of building materials at Berlin have declined rapidly of late. This is ascribed to the completion of several large public works like the Houses of Parliament and the slackness of private building enterprise. There is a serious decrease in the demand for materials.—Interesting experiments are being carried out at Berlin with some new refuse destructors. The whole of the Berlin street and house refuse will probably soon be treated by these destructors. The number of inhabitants in the area under consideration is 1,700,000, and the refuse amounts to nearly 1,000,000 cubic metres per annum, or 1,000 cartloads per diem.—A novel kind of permanent building exhibition is to be opened at Cologne this month. Besides having showrooms for trade exhibits there will be a library for architects, or their clients, and a large collection of plans for every class of building, with specifications and quantities complete. Architects are at liberty to refer to these gratis. The rental paid by trade exhibitors will cover all expenses.—The delegates of the German Engineering Societies have had their annual meeting at Aix-la-Chapelle, from the 19th to 21st. The agenda-paper included a number of technical subjects for discussion, and there was the usual amount of interesting sight-seeing.—The Amalgamated German Archaeological Society and historical societies will have their annual gathering at Konstanz from September 15 to 18, and an elaborate programme of lectures and sight-seeing has been arranged for the delegates.

AUSTRIA.—The tombstone on Von Hansen's grave, which is an elaborate monument designed by Professors Neimann and Kundmann, has been completed. The grave is in the central churchyard at Vienna, and the tombstone is the gift of the magistrates and Municipality of the Austrian capital.—A competition has been opened for schemes for the new electric metropolitan railway lines at Vienna. The competition is practically intended for contractors, as estimates are required, with a guarantee to complete the work for the sums named.—A new museum building is to be erected at Reichenberg for what is known as the North Bohemian Industrial Collections. The cost of the building is not to exceed 50,000. There will be a committee of seven assessors, and substantial premiums.—The new University buildings at Graz are now ready for occupation.—At Budapest the preparations for the Millennium Exhibition are making the town most uncomfortable during the progress of the works, as among other thoroughfares, the important Andrássy Avenue is still blocked for the construction of the underground railway. One of the new bridges over the Danube will now certainly be ready in time for the opening. This is the so-called "Zollamt" bridge, which will have three spans; the middle one measures 175 m., the two side ones 78 m.

BAVARIA.—According to the *Centralblatt der Bauverwaltung*, the important office of the City Architect of Munich will be given to Herr Schwenning, who is at present City Architect at Lübeck. As Munich is to have many improvements in the course of the next few years, the post will be a very responsible one. Among the latest schemes in view is the one for the opening up of the suburb St. Anna, and the erection of a number of public buildings on the east side of the Royal Gardens.—Besides the annual exhibition of pictures in the Crystal Palace at Munich, an exhibition arranged by the Society for Christian Art has now been opened. The exhibition includes a large number of pictures of sacred subjects, as well as some which are considered of high moral tone. Sculpture and the arts and crafts are well represented. A number of architects have also shown models or drawings of churches, altars, &c.—The buildings for the Bavarian Industrial Exhibition, which will be opened on May 15 next year, are now in course of erection. The main gallery measures about 600 ft. by 150 ft., and has a number of wings, each 150 ft. long. The machinery-hall will be 450 ft. long. We understand that a model theatre is to be erected, in which the stage machinery will be worked by electricity, according to a scheme by Herr Lautenschlager, of the Munich Opera.—The Schack Gallery at Munich, which is now again open to the public, has been renovated under the supervision of Herr Seidl.—Bayreuth is to have a casino, and a competition has been opened for the design. Visitors who attend the Wagner Opera season next year will appreciate this improvement, as the general accommodation at Bayreuth is very poor.—At Aschaffenburg a memorial fountain is to be erected in memory of King Louis I. of Bavaria. The design is a subject for competition among Bavarian architects and sculptors. The

fountain is to cost 2,000. A memorial chapel is to be erected in memory of King Ludwig II. of Bavaria in the castle grounds on the Starnberg Lake. The site is near the point where the king's death occurred. The cost of the chapel will be 20,000, and Herr E. Hoffmann, of Munich, has the commission. A marble sarcophagus will be placed in the crypt.

MISCELLANEOUS.

THE LONDON AND PROVINCIAL BUILDERS' FOREMEN'S ASSOCIATION.—This Association held its second annual dinner on Saturday evening last, at "Ye Olde Four Swans," Waltham Cross. After the usual loyal and patriotic toasts, "The London and Provincial Builders' Foremen's Association" was given by Mr. Ackerman; and Mr. Elden, the President, in replying, heartily congratulated the Association on the strides it had made—their membership having trebled since their last dinner—and expressed the hope that in the near future their Society would be a power for good in the building trade. Their motto was "Defence, not Defiance," and he felt sure the influence they possessed, placed as they were among employers and workmen, would be always exerted to bring about more amicable relations between the two. "The Builders' Merchants of London," coupled with the name of the "Acton Brick Manufacturing Company," was responded to by Mr. Piggett, who assured the members that the merchants were fully alive to the importance of the Society, and were in thorough sympathy with its aims. Mr. Barclay proposed the health of their first secretary, Mr. Soale, who had come from Cardiff in order to be present that evening, and congratulated him on the success that had followed his exertions to found a "live organisation." Mr. Soale replied.

SANITATION IN CORNWALL.—In their monthly report for July the Sanitary Committee of the Cornwall County Council state that the health returns are again of a decidedly encouraging character. The general death-rate now stands at 12.34, which is 3.24 below what it was for June, and 0.24 below the corresponding period of last year. Typhoid shows a considerable increase. It has jumped up to twenty-four cases, one death from nine cases and one death for June. The principal centres are Truro Rural (ten cases) and Penzance Urban (five cases). Happily the cases have been of a mild type and without fatal consequences. In Truro Rural the Authority has at last recognised the fact that it cannot any longer afford to ignore the repeated complaints of its Medical Officer, where other cases of typhoid have recently occurred.

LONDON WATER SUPPLY.—In their report on the composition and quality of daily samples of the water supplied to London, for the month ending July 31, Mr. William Crookes, F.R.S., and Professor Dewar, F.R.S., state that the high-level of purity of the Thames-water, compared to what they drew attention in the report for June, was sustained in July, notwithstanding the fact that turbidity and peaty colouring matters are always washed from the land into a river by heavy rain following a drought. A comparison of the chemical composition of the waters in July and in June shows that the constituents are almost identical in quality. They have continued to examine the samples drawn from the clear water wells of the water companies at their works, and from the unfiltered river water. The unfiltered Thames water contained an average of 3.425, and the filtered water at the works contained 30 microbes per cubic centimetre.

CHICAGO EXHIBITION, 1893.—We mentioned last week that the two British representatives at the Chicago Exhibition, Sir R. Webster and Sir H. Trueman Wood, have received complimentary diplomas, which were issued by the President of the United States. The exhibitors, we are informed, who were (nominally) awarded honours, have received nothing up to this date, save a book-maker-like ribbon, and their respective names upon it, for which they were all charged 3 dollars (12s. 6d.) apiece.

NEW MONUMENT, YORK MINSTER.—On the 9th inst. a monument erected in memory of the late Archbishop Thomson was unveiled in York Minster. The memorial stands beneath a blank arch in the east wall of the choir transept. The design is in the Early Perpendicular style. For the most part the work has been carried out in Tottenhoe Clunch stone, from Bedfordshire. The plinth and step of the altar-tomb are of Belgian black marble, while in one or two parts white Carrara marble is used. There are nine panels in front of the altar-tomb, each of which is filled by the figure of an angel.

On a shield borne by the central figure are engraved the letters "I.H.C.," the letters "N.P.C." appearing on the shields of the figures at the two extremities. On the other six shields are carved emblems of the Passion. These panels are surmounted by a slab of marble, on which rests a sculptured effigy of the late Archbishop in a recumbent position. Mr. Thornycroft, R.A., was the sculptor entrusted with the task of reproducing the features of Dr. Thomson. On each side of the altar-tomb are buttresses, with pinnacles, rising from the base to the cresting of the canopy. In the canopy itself are tracery windows, perforated and pointed out with crockets, finials, and other ornamentation. The whole is surmounted by cresting. The canopy is groined beneath with fan gironing, terminated by pendants. The memorial was designed by Mr. Bodley, of the firm of Messrs. Bodley & Garner, who are consulting architects to the Dean and Chapter. The contractors were Messrs. Farmer, Brindley, of London.

TRADE OUTRAGE.—On the 10th inst., on the invitation of Mr. Howard Colls, the foremen in the employ of Messrs. Colls & Sons, with several clerks of works, numbering about fifty, had an excursion. Taking train to Swanley, brakes were in waiting to drive them to the ancient church of St. Margaret, Darent, where the vicar met the party, and, after pointing out the most interesting features in the building, explained the various alterations which had been made at different periods. The party then proceeded to view the remains of the Roman Villa, the immediate vicinity, which have been recently discovered. Mr. Payne, F.S.A., who superintended the excavations, attended by Mr. Edgerton, at various portions of the remains. The drive was then continued to the "Lion Hotel" Farningham, where dinner was provided.

Number of the employes of Messrs. Lathey Brothers, St. George's Works, Battersea, went on their annual beef-steak to Bournemouth on Saturday last. Dinner was presided over by Mr. Edgerton, who was supported by his two elder sons. SHROPSHIRE ARCHAEOLOGICAL SOCIETY.—The annual excursion of the Shropshire Archaeological and Natural History Society took place on the 13th inst. in the Ludlow district. The members, arriving at Ludlow, proceeded to Bitterley Court, where some valuable MSS. and relics of Charles I. were inspected. The old parish church and its Norman crosses were also visited and inspected, and the post afterwards drove to Whitting Court, built by Robert Charlton, father of Sir Job Charlton, where the tapestried rooms were visited. From Whitting Court members drove through Greet to Burford Church, where the triptych to the memory of Edward Cornwall, Baron of Burford and Sheriff of Salop, 1380, was examined; also in the canopy under the chancel were observed recumbent figures of Prince Elizabeth, daughter of John of Gaunt, and another of Edmund Cornwall; also a Perpendicular font, piscina, a carved screen, and some encaustic tiles. On returning from Burford to Ludlow a visit was made to Caynam Camp. The party returned to Ludlow for tea, and left for Shrewsbury in the evening.

SMELLS IN THE HOUSE OF COMMONS.—In the House of Commons on Tuesday Mr. Hermon Hodge asked the First Commissioner of Works whether he was aware that during the session of the afternoon there was a most horrible smell of drains in the neighbourhood of the Bar of the House, and whether he would endeavour to put stop to a state of things that was not uncommon in the House, and was very prejudicial to the health of Members.—Mr. Akers Douglas said he had had notice of the question, but he would make inquiry at once.

LEGAL.

BUILDING DISPUTE AT RICHMOND.

The case of the Corporation of Richmond v. Harper came before Mr. Justice Mathew, sitting in Vacation Judge, on Tuesday last, it being a motion on behalf of the plaintiff Corporation to continue interim order made by his Lordship, extending to Tuesday, restraining the defendant from erecting any buildings in the Lichfield-road, Richmond, beyond the front main wall of the houses or buildings on the other side thereof without the plaintiff's consent.

Mr. Oswald, Q.C., M.P., and Mr. Macmonn appeared as counsel for the plaintiff Corporation, while Mr. Marten, Q.C., represented the defendant. Mr. Oswald said that the application was made under the Statute of 1883, which provided that one should, without the written consent of the Urban Authority, erect or bring forward any house or building in any street beyond the front main wall of the houses or buildings on either side thereof in same street.

Mr. Marten said that the defendant denied that the road was called Lichfield-road. There were two points in the case. One was that it was not same street, and the other that there was no building "on either side" within the meaning of the Act of Parliament.

Mr. Oswald said that his Lordship would decide on the plan that on the south side of Lichfield road there were twelve houses forming a clear frontage. That line of frontage was 22 ft. fr.

pavement; that was to say, that there were courts or gardens in the front of those houses which were 22 ft. in depth. What the defendant did was to begin to build—he had only got the foundations in—without the approval or consent of the Corporation, which was the Urban Authority, of the houses, and had admittedly put the front of the houses 15 ft. 9 in. in front of the other twelve which formed the line of frontage on the north side of the road, only giving about 6 ft. between his proposed houses and the road. The defendant was an important thoroughfare, and one of the houses which had been erected were of considerable value.

His Lordship: What is the distance of the nearest use? Mr. Oswald: 175 ft., we say; the defendant says, 4 ft.

Continuing, the learned counsel said that the defendant's contention was that the part of the road in question was in the Broadway, and not in the off-street-road, and he had put up on the houses he was building the word "Broadway." He (the defendant) did not pretend that the Local Authorities had ever changed the name of the Lichfield-road, it because he called his houses "Broadway" he did to say that there were two rows—one the way on the Lichfield-road.

His Lordship: It is a very serious thing to interfere with property in this way. This man has bought the land, and is entitled to use it. In a new locality like this it is a strong thing to say that an individual should use his land to the best advantage. Mr. Oswald: It is not a new locality. He bought his land and put his houses up, and knew the line of the road and the Act of Parliament of 1888.

His Lordship said that it was not a matter he would decide then. Mr. Marten said that the defendant was willing to give an undertaking to "pull down," if it was proved at the trial of the action. What the defendant was willing to do, was to go on building and to take his chances at the trial. The plaintiff is aware that the defendant was under a time contract as to one of the buildings, which was going to be a post-office.

After some further discussion, it was arranged that the defendant should make no order on the motion, the defendant undertaking to "pull down" if it was proved that he was wrong at the trial, that the defendant should be required, as the points in issue were sufficiently raised on the affidavits; and with liberty to apply to advance the trial.

BUILDING INTO A WALL.

The case of *Forrest v. Dodson* came before Mr. Justice Mathew, sitting as Vacation Judge, on Tuesday last, it being a motion to restrain the defendant by injunction from cutting into or building to the plaintiff's wall. His Lordship made no order on the motion on the defendant undertaking to "pull down" if, at the trial of the action, the case was decided against him.

ALLEGED TRESPASS ON A WALL.

The case of *Podmore v. Mayhew* came before Mr. Justice Mathew, sitting as Vacation Judge, on Tuesday last, it being a motion to restrain the defendant from committing an alleged trespass on the plaintiff's premises in building brickwork into the plaintiff's wall.

His Lordship made no order on the motion on the defendant agreeing to "pull down," in the event of his being held to be in the wrong when the action was tried.

PARTY-WALL DISPUTE.

The case of *Alchin v. Hosegood*, on Tuesday last, before Mr. Justice Mathew, sitting as Vacation Judge, on the motion of the plaintiff to restrain the defendant, by injunction, from interfering with party-wall without complying with the provisions of the London Building Act.

It appeared that Mr. Justice Chitty granted an interim injunction over Tuesday, restraining the defendant in the terms of the notice of motion. In the result, by consent, the defendant submitted a perpetual injunction in the terms of the notice of motion, agreed to pay the plaintiff's costs, and to treat the motion as the trial of the action.

LITIGATION AS TO A WALL AT NORWICH.

The case of *Freeman v. Robbins* came before Mr. Justice Mathew, sitting as Vacation Judge, on Tuesday last, on the motion of the plaintiff, the holder of a house in Marlborough-ways, Norwich, to restrain the defendant from removing or pulling down a certain wall or fence, or from otherwise interfering with it. The plaintiff also claimed a perpetual injunction ordering the defendant to maintain the plaintiff's wall fence.

His Lordship made no order on the motion on the defendant consenting to "pull down" after the trial of the trial if he should be held to be in the wrong.

CAPITAL AND LABOUR.

STATE OF EMPLOYMENT IN JULY.—The August issue of the *Labour Gazette* states that there has been a further improvement, on the whole, during the month in the state of the labour market, and the percentage of unemployed in unions making returns has continued to decline. In the eighty-six trade unions, with an aggregate membership of 391,093, making returns, 20,574 (or 5.3 per cent.) are reported as unemployed at the end of July, compared with 5.6 per cent. in June, and 7.4 per cent. in the fifty-two unions making returns for July, 1894. The building trades, on the whole, continue busy, and the percentage of unemployed in the unions making returns has fallen from 2.5 in June to 2.4 in July, compared with 3.6 in July last year. Ten disputes have taken place in the building trades, three of which were chiefly due to wages questions, three were on questions of working arrangements, three were due to the refusal of the men to work with non-unionists, and the remaining one was a demand for the reinstatement of discharged colleagues.

JOINERS' WAGES IN EDINBURGH AND LEITH.—A mass meeting of the joiners in Edinburgh and Leith was held on the 16th inst. in the Oddfellows' Hall, Edinburgh. The meeting was convened for the purpose of considering the position of the trade as a whole, in view of the notice given making a demand for an advance from 8d. to 8½d. per hour, thus raising the weekly wage from 24s. to 26s. 13d. About a year ago the men decided to ask for an eight-hours day or forty-five-hours' week, but the masters declined to discuss the question before the Conciliation Board or to submit it to an arbitrator. The men then reviewed their attitude, and the present demand for an increase of ½d. per hour was the result. The masters made an offer of one farthing advance, but the men refused to accept that concession. At the meeting on the 16th inst. it appeared from reports submitted that only twenty-seven of the masters had agreed to grant the increase in view of a general agreement being brought about with the masters, others had either refused or had not been individually approached on the matter, and these formed the large majority of the masters. The vote was taken as between a motion to strike and an amendment not to strike. The amendment was adopted by a large majority. In view of the result of this vote the notice for an increase will be withdrawn.

SUB-CONTRACTING AND GOVERNMENT CONTRACTS.—Mr. Akers-Douglas, First Commissioner of Works, has received a deputation of the Building Trades' Federation on the subject of sub-contracting, and as the result of the interview, requested the Federation to draw up a clause suitable for insertion in Government contracts.

THE BUILDING TRADE IN DUNDEE.—All departments of the building trade in Dundee, says the *Dundee Advertiser*, are at present in a state of more than average briskness, and labour is in consequence practically fully employed. The masons in particular are experiencing the benefits of the improved condition of affairs. For instance, a great demand exists for brewers, every yard in the city being hard at it, and employers are complaining that the supply is wholly inadequate to cope with the requirements. Men in quest of work are a rarity, and in explanation of this fact it is stated that in St. Andrews, Kirkcaldy, and other places in Fife there is at the present time something like a building "boom," big contracts and plenty of them being the order of the day, and that employers there cannot find enough men to undertake the rush of work. Although the pliers of stone and mortar are thus flourishing matters, it is feared in several quarters that the spurt will not last for a longer period. The reason given—that is to say, the principal reason—for this pessimistic opinion emanates from the masters, and may be commended to the attention of the operatives as worthy of their serious consideration. It is urged that the recent advance in wages from 8d. and 8½d. to 9d. and 9½. per hour has had the immediate effect of putting a stop to several important contracts that were pending.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.
14,462.—CONSTRUCTION OF WATER-CLOSETS; *W. Hodgson*.—The object of this invention is to provide a large area of water surface with only a small surface of basin exposed, and a deep seal trap. The flushing arm, in a vertical position, and the side of the basin inclined about 45 deg. The basin is sloped and semicircular in shape, and the space between the level of the water and the top of the basin is greatly shortened.
16,583.—ROOFTOP TILES; *H. E. Hayes*.—A dovetail locking joint is, according to this patent, formed by making projections and recesses to engage with each other. In one set the projections, &c., are made in the centre, and in the other at the opposite end, so as to break joint.
21,937.—DRAINS AND SEWERS; *J. Barker*.—This patent relates to an improved method of ventilating drains and sewers. It consists in causing a current of air to flow through a conduit or pipe arranged above, and communicating at intervals with the drain or sewer, whereby the foul gases are withdrawn from their escape into the atmosphere.
8,515.—THROUGH CLOSETS; *J. Rimmer*.—Where the closets are flushed by waste water collected in a tipping basin, the trough of a water-closet forms the bottom of a pit, or well. The waste water is discharged into a pipe, one end of the trough, the other end of the trough opening into a specially-formed open-mouthed trapped outlet-pipe.

At the junction of the trough end and outlet-pipe a horizontal well, or sill, is formed, insuring a certain depth of water remaining in the trough after each flush out.
30,804.—SAWS FOR STEEL; *J. Oldham*.—These saws have separate specially-shaped and hardened teeth, which are inserted in a disc, and run at a rate cutting the hardest steel.

11,344.—FLUSHING WATER-CLOSETS.—Taps, or valves and service-pipes are provided in order to enable high-pressure water to be delivered direct into the pans of the closets, so as to utilise its full force, and at the same time make provision for automatically shutting off the high-pressure water after a sufficient quantity has been supplied, and also for supplying a small quantity of water to the pan of the closet by way of an after-flush, in order to ensure a sufficient quantity of water always remaining in the pan.

NEW APPLICATIONS FOR LETTERS PATENT.
AUGUST 6.—14,803, H. Cartledge Potter's Kilns.—14,805, J. Kennedy, Facilitating the Painting of Windows.—14,813, G. Johns, Machine for Piercing Holes in Wood.—14,815, G. Johns, Cramp for Light Wooden Frames.—14,816, G. Collinson, Supporting Tiles, &c., while being fired.—14,849, H. Joly, Girders.—14,859, A. Bout, Temporary Fixing of Doors, Windows, &c.
AUGUST 7.—14,903, R. McKellar, Smoke and Ventilating Cows.—14,897, J. Millar, Friction Hinges.—14,926, E. Schumacher and F. Feller, Clue or Size.—14,940, H. Macklin, Catches for Doors, &c.
AUGUST 8.—14,942, W. Firth, Drain and Pipe Stop or Plug for Testing Pipes or Drains.—14,950, J. Welton, Levers.—14,951, A. Ashworth, Locks for Desks, Cabinets, &c.—14,958, J. and W. Allen, Locking and Movable Air-tight Joint for Sockets of Sanitary and other Cylindrical Pipes.—14,967, A. Wilson, Windows.—14,966, W. Treseller, Bricks and Screws.—14,976, A. Bupp, Artificial Wood and Stone for Building, and other purposes.—14,979, H. Coombs, Water-waste Preventer, &c.—15,001, A. MacIver, Construction of Windows.

AUGUST 9.—15,016, J. Shuttleworth, Window or Sash Fastener.—15,019, R. Taylor and D. Moseley, Side Guards for Doors.—15,020, R. Doenitz, Ventilating Elbow-pipe for Stoves.—15,024, S. Rowley, Syphon Water-closets.—15,029, E. Wynne, Ladder Runners.—15,031, G. Forell, Portland Cement.—15,061, R. Allison, Sash Fasteners.
AUGUST 10.—15,071, T. Hall, Masons and Builders' Scaffolding.—15,102, W. Youlten, Top Sash Openers.

PROVISIONAL SPECIFICATIONS ACCEPTED.
11,075, T. Daly, Window Ventilation.—11,132, D. Simpson and A. Cross, Hinge.—12,661, A. McGarry, Shell Wind-Guard Chimney-top.—12,788, J. Timpon, Whitewash or Colouring Composition.—13,009, J. Benton, Automatic Feed for Small Circular Saw-benches for Steam Power.—13,159, J. Orton, Screws and Screw-drivers.—14,235, H. Jones, of the firm of W. P. Thompson & Co., Chimney Cowl, &c.—14,310, C. Zapp, Window-catches or Fasteners.—14,351, R. Taylor, jun., and L. Dunkerley, Machines for Sharpening Saws.

COMPLETE SPECIFICATIONS ACCEPTED.
(Open to Opposition for Two Months).
18,261, R. Pye, Moistening, Heating, Cooling, and Ventilating Factories, &c.—19,243, J. Keith, Radiators for Heating and Ventilating.—12,957, H. Wood, Bricks, Tiles, &c.—13,033, J. Bernheimer and T. Manger, Door Fasteners and Apparatus for Operating the same from a distance.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

AUGUST 13.—By *W. Simmonds*: 113, 115, 117, and 119, New-st., Camberwell, u.t. 9 yrs., g.t. 204, 225½, 268, Albany-rd., f.t. 381, 545½; 331, Albany-rd., f.t. 421, 650t. By *Dentum, Tenson, Farmer & Bridgewater*: "Langdon Abbey" Farm, West Langdon Kent, containing 629 a. r. 27 p. f. 5, 500t.—By *Frith & Morris*: "Burnt Oak Farm," Crittwell, Southend, containing 14 a. r. 33 p. f. 4, 925t.; an enclosure of land, Leigh, 9 a. r. 25 p. f. 1, 650t.; "Little Polly" Farm, containing 16 a. r. 1 p. f. and c. 700t.; two enclosures of land, Princetown, containing 14 a. r. 22 p. c., 610t. By *Reynolds & Bacon*: 28 and 30, Frampton Pk.-rd., Hackney, u.t. 60 yrs., g.t. 86, 555t.—By *E. & H. Lumley*: 24, Hemmets-st., Hoxton, u.t. 36 yrs., g.t. 128, 150t.—By *F. J. Biley & Sons*: 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50 yrs., g.t. 91, 150t.; 5, Clarence-st., f. 1, 707t. 5 and 6, Trundley-st., Deptford, u.t. 71 yrs., g.t. 91, 108t. f. 64t. 8s. 400t.—By *E. & H. Lumley* (at Teignmouth): Freehold rent charges of 28t. 10s., West Teignmouth, Devon, 670t.; a building site, Exeter-rd., containing 1 a. r. 37 p. f. 1, 250t.; enclosures of land, Buckridge-rd., 10 a. r. 1 p. f. 1, 451t. 100t.; "Sandy Mount," Exeter-rd., and half an acre, 425t.

AUGUST 14.—By *Rutley, Son, & Co.*: 86 and 88, St. Mary's-rd., Peckham, u.t. 73 yrs., g.t. 101, 68t. f. 50t., 540t.; 29, Clarendon-st., Harrow-rd., u.t. 37 yrs., g.t. 81, r. 39t. 150t.; 68, Avenue-rd., Acton, f. 340t.; 95, Granville-rd., Kilburn, u.t. 67 yrs., g.t. 81, 108t. 100t.; 103, Granville-rd., u.t. 67 yrs., g.t. 81, 108t. 100t.—By *Allen & Heath*: 2 p. g.t. of 30t. Belmont-rd., Willesden, reversion in 98 yrs., 780t.—By *W. R. Smith & Son*: 37, Werrington-st., St. Pancras, u.t. 54 yrs., g.t. 101, 235t.—By *E. H. Henry*: 66, Lansdowne-rd., South Lambeth, u.t. 47 yrs., g.t. 101, 45t. f. 65t. 675t.; No. 439, Wandsworth-rd., u.t. 7 yrs., g.t. 61, 158t. f. 54t. 195t. 100t.; Nos. 306 and 308, u.t. 5 yrs., g.t. 221, 110t.; 7 and 9, Westmoreland-st., Finsbury, u.t. 35 yrs., g.t. 321, 570t.; 60, High-st., Hounslow, c. 195t.—By *H. Martin*: 5, 7, and 9, Mount Vaux, Dulwich, u.t. 80 yrs., g.t. 181, r. 88t. 724t.; 29 and 31, Wildash rd., u.t. 80 yrs., g.t. 151, r. 60t. 615t.

AUGUST 15.—By *J. Hubbard & Sons*: "The South London Music Hall," London-rd., Southwark, with buildings in rear, u.t. 45 and 44 yrs., g.t. 465t. 28, 100t.—By *Stinson & Sons*: 31 and 33, Worrell-st., Rattlesden, u.t. 70 yrs., g.t. 74, r. 54t. 335t.; 68, Westmoreland-rd., City-rd., f. 1, 39t. 350t.; 84, Westmoreland-rd., f. 1, 350t.; 60, Fairholt-rd., Stoke Newington, u.t. 84 yrs., g.t. 81, 454t. 475t.; 17 and 19, Hartman-rd., Holloway, u.t. 75 yrs., g.t. 161, 166t. 700t.; 57, Canon-st., Peckham, u.t. 67 yrs., g.t. 47, 48t. r. 28t. 125t. 150t.; 5, Archdale-rd., Dulwich, u.t. 79 yrs., g.t. 47, r. 23t. 88t. 100t.; "Hedder Lodge," Belmont-rd., Twickenham, u.t. 60 yrs., g.t. 101, 108t. r. 40t. 400t.; 150t. of 3t. Raby-rd., New Malden, f. reversion in 86 yrs., 75t.; 100, 102, 106, 108, 110, and 112, Alexander-rd., Holloway, u.t. 68 yrs., g.t. 371, 165t. r. 178t. 1,300t.; 30 and 32, Montpelier-rd., Waltham, u.t. 20 yrs., g.t. 94, f. 14t. 165t. 300t.; 58, Chaucer-rd., Herne Hill, u.t. 75 yrs., g.t. 61, r. 32t. 950t.—By *T. B. Westcott*: 40 and 42,

TIMBER			TIMBER (continued).		
Greenham, B.G.	8 1/2%	5 1/2%	Satin, Porto Rico	0 1/2%	0 1/2%
Teak, E.I., load	10 1/2%	16 1/2%	Walnut, Italian...	0 1/2%	0 1/2%
Aspen, 1000 ft.	1 1/2%	1 1/2%			
Ask, Canada load	2 1/2%	2 1/2%			
Burch, do.	1 1/2%	1 1/2%			
Elm, do.	1 1/2%	1 1/2%			
Fur, Danzig, 30c	1 1/2%	1 1/2%			
Flax, do.	1 1/2%	1 1/2%			
Canada, 1000 ft.	0 1/2%	7 1/2%			
Pin, do.	1 1/2%	1 1/2%			
Do. Yellow...	2 1/2%	5 1/2%			
Lath, Danzig, 30c	1 1/2%	1 1/2%			
Walnut, do.	1 1/2%	1 1/2%			
Washcott, Riggs,	1 1/2%	1 1/2%			
Do. Yellow...	1 1/2%	1 1/2%			
Oleas, Crown...	1 1/2%	1 1/2%			
Do. Yellow...	1 1/2%	1 1/2%			
Do. 1st & 2nd...	1 1/2%	8 1/2%			
Do. 3rd & 3rd...	1 1/2%	8 1/2%			
Do. 4th & 4th...	1 1/2%	8 1/2%			
St. Petersburg,	1 1/2%	1 1/2%			
Do. Yellow...	1 1/2%	1 1/2%			
Do. White...	1 1/2%	1 1/2%			
Do. White...	1 1/2%	1 1/2%			
White Sea...	1 1/2%	1 1/2%			
Do. 1st & 2nd...	1 1/2%	1 1/2%			
Do. 3rd, 3rd...	1 1/2%	1 1/2%			
Do. 4th, 4th...	1 1/2%	1 1/2%			
Do. 3rd and...	1 1/2%	1 1/2%			
Do. 3rd and...	1 1/2%	1 1/2%			
New Brunswick	1 1/2%	1 1/2%			
Hats all kinds	1 1/2%	1 1/2%			
Flint, 1000 ft.	1 1/2%	1 1/2%			
sq. in. prep.	1 1/2%	1 1/2%			
Do. 1st and...	1 1/2%	1 1/2%			
Do. 2nd and...	1 1/2%	1 1/2%			
Do. 3rd and...	1 1/2%	1 1/2%			
Cedar, Cuba, 1st	1 1/2%	1 1/2%			
Montreal, 30c	1 1/2%	1 1/2%			
St. Domingo,	1 1/2%	1 1/2%			
Mexican do.	1 1/2%	1 1/2%			
Toledo do.	1 1/2%	1 1/2%			
Do. 1st and...	1 1/2%	1 1/2%			
Rox, Turkey ton	1 1/2%	1 1/2%			
Do. 1st and...	1 1/2%	1 1/2%			
Dahla...	1 1/2%	1 1/2%			
Pin...	1 1/2%	1 1/2%			
St. Domingo...	1 1/2%	1 1/2%			

ASHFELDS (N.B.) For the erection of a bridge over the river Galla, for the Corporation —

Table with 2 columns: Name and Amount. Includes William Oliver, Edinburgh (accepted) £565.

DILLINGHAM (Kent) For the execution of main drainage works for the Urban District Council. Messrs. Taylor, Sons, & Co., Climp, engineers, 27, Great George-street, Westminster, W.

Table with 2 columns: Name and Amount. Includes W. & T. Dennis £2,550 0 0, John Shum £2,550 0 0, etc.

GOOD EASTER (Hesse) For additions to school building, for the School Board. Mr. Richard Mawhood, architect, 25, Baker-street, Chelsea, S.W.

Table with 2 columns: Name and Amount. Includes C. G. Holland, Gt. Leighs, £995 0 0 (accepted).

GOWERTON. For additions to Board Schools, Gowerston, near Walsby. Mr. T. P. Martin, architect, Swansea. Quantities by the architect —

Table with 2 columns: Name and Amount. Includes T. D. Williams £500 0 0, James Swab £300 14 6, etc.

GRINBY. For rebuilding stores on the fish docks —

Table with 2 columns: Name and Amount. Includes F. Grant £145 19 0, F. Walker, Abbey £135 0 0 (accepted).

HALIFAX. Accepted for the erection of school buildings, copper-terrace, Lady Field, for the School Board. Mr. Joseph Walsh, architect, Bank-lambers, Halifax. Quantities by the architect —

Table with 2 columns: Name and Amount. Includes George Tyson, Dunkirk, Halifax £1,200 12 0, F. Greenwood, Gurnall, Halifax £100 0 0, etc.

HALIFAX. For drainage and decorative work at Elm-grove, annd. Messrs. Inman & Jackson, architects, 7, Bedford-row, annd, W.C.

Table with 2 columns: Name and Amount. Includes Adamson & Sons £140 5 0, G. W. Pearce £39 10 0.

HEREFORD. For the erection of offices, warehouses, &c., at Corporation Key Market, Broad-street, &c., for the Corporation. Mr. J. Parker, City Surveyor, Hereford —

Table with 2 columns: Name and Amount. Includes W. Bowers & Co. £1,410 10 0, H. Easton, Hereford £1,174 8 0.

IRLAM (Lancs.) For paving, &c., roads within the district, for the Urban Sanitary Authority. Mr. W. R. Kay, Surveyor, Council offices, Irlam —

Table with 2 columns: Name and Amount. Includes Messrs. Mullett, Booker, & Co., surveyors £30 0 0.

KINGSCLERE. For the erection of schoolroom, &c., for the trustees. Mr. W. H. Bell, architect, Market-place, Newbury —

Table with 2 columns: Name and Amount. Includes Head £519 0 0, James Newbury £47 0 0 (accepted).

KNOCKHOLT (Kent) For erecting residence at Knockholt, estate, for Dr. Steiner. Messrs. Barnes-Williams, Ford, & Griffin, architects —

Table with 2 columns: Name and Amount. Includes Marsland £1,990 0 0, Bartley, Sons, & Helms, £500 0 0 (accepted).

LONDON. For alterations to "The Victoria Tavern," Burdett-street, E.C. Mr. F. A. Ashton, architect —

Table with 2 columns: Name and Amount. Includes J. & H. Cocks £1,508 0 0, W. Watson £2,993 0 0, etc.

LONDON. For rebuilding the "Earl of Derby" public-house, at St. Mary's, E.C. Mr. F. A. Ashton, architect —

Table with 2 columns: Name and Amount. Includes W. Watson £1,993 0 0, J. & H. Cocks £2,993 0 0, etc.

LONDON. For the erection of new public baths and wash-rooms, for the Commissioners of St. Marylebone Parish. Mr. A. S. Smith, architect. Quantities by Messrs. Northcroft, Son, & Co., architects —

Table with 2 columns: Name and Amount. Includes F. & H. F. Higgs £4,675 0 0, J. & H. Cocks £4,680 0 0, etc.

LONDON. For alterations to "The Bird in the Lion" public-house, West Ham-lane, E. Mr. F. A. Ashton, architect —

Table with 2 columns: Name and Amount. Includes H. & F. Farrow £1,447 0 0, W. Watson £1,495 0 0, etc.

LONDON. For erecting chimney shaft at Lea Valley Works, for Messrs. Connel & Co. Mr. J. Hamilton, architect —

Table with 2 columns: Name and Amount. Includes Mr. J. Hamilton £1,603 0 0, W. Shum £1,435 0 0, etc.

LONDON. For works to new warehouse, &c., Long Acre, W. Mr. W. A. Finch, architect —

Table with 2 columns: Name and Amount. Includes Kilby & Gayford £4,554 0 0, R. E. Wosley & Co. £4,459 0 0.

LONDON. For the erection of water-tower, &c., at Exchequer Mills, Hackney, E. Mr. J. Hamilton, architect —

Table with 2 columns: Name and Amount. Includes W. Shum £1,583 0 0, W. Shum (accepted) £180 0 0.

LONDON. For erecting warehouses at Pentonville. Mr. H. H. Taylor, architect —

Table with 2 columns: Name and Amount. Includes Hunt £485 0 0, Deans £431 0 0, etc.

LONDON. For alterations to Mile End National Schools. Mr. A. Cox, architect —

Table with 2 columns: Name and Amount. Includes Harris & Wardrop £4,440 0 0, Grover & Son £4,745 0 0, etc.

LONDON. For building the Hackney Parochial School, Hammer-smith, N. Mr. A. Cox, architect —

Table with 2 columns: Name and Amount. Includes Potesque £3,976 0 0, Perry & Co. £3,949 0 0, etc.

LONDON. For the erection of engine and pump-room, Lower Manor-street, Woodwich, for the Local Board. Mr. H. H. Church, architect, William-street, Woodwich. Quantities by Mr. W. Whelan, architect, William-street, Woodwich —

Table with 2 columns: Name and Amount. Includes Brown £685 0 0, Holway, Deppford £270 0 0 (accepted).

LONDON. For the erection of ironing-room, &c., for the French Cleaners and Dyers Company, Southgate. Mr. George K. Denby, architect, Southgate, N. —

Table with 2 columns: Name and Amount. Includes W. Pavey £1,000 0 0, J. P. Puck £500 0 0 (accepted).

LONDON. Accepted for the erection of stables, Southgate, N., for Mr. John Eaton —

Table with 2 columns: Name and Amount. Includes C. Newby £750 0 0.

LONDON. For proposed additions, &c., to No. 38, Spencer Park, Wandsworth Common, S.W., for Mr. A. A. Whiting. Messrs. Benston & Burnester, architects —

Table with 2 columns: Name and Amount. Includes T. O. Green £837 0 0, Ed. Heather £837 0 0, etc.

LONDON. For repairs, decorations, &c., house and stables, No. 25, Holland Park, W. Messrs. Mullett, Booker, & Co., surveyors —

Table with 2 columns: Name and Amount. Includes Kinnmont & Sons £715 0 0, Pears & Co. £30 18 0.

LONDON. For erecting new wing to the Kindergarten Training College in Talgarth-road, West Kensington, for the Committee of the Froebel Educational Institute. Mr. J. S. Quiller, architect —

Table with 2 columns: Name and Amount. Includes Bartley, Sons, & Helms £470 0 0 (accepted).

LONDON. Accepted for alterations and reinstating carriage factory, Nos. 12, 13, and 14, Earl's Court-road, Kensington, after fire, for Henry Whitlock, Mr. S. Wilson, surveyor, 34, New Bridge-street, E.C. —

Table with 2 columns: Name and Amount. Includes John Barker & Co., Ltd., Kensington £370 0 0.

LONDON. For forming new dry areas at the Cleveland-street Asylum, for the Managers of the Central London Sick Asylum District. Mr. W. S. Lott, architect. Quantities by Mr. A. C. Cross —

Table with 2 columns: Name and Amount. Includes Love £184 15 2, Nicholson £179 15 0, etc.

LOUTH (Lincs.) For the erection of class-room, &c., for the Fulstow School Board. Mr. W. G. Frost, architect, 153, Victoria-road, Gmaby —

Table with 2 columns: Name and Amount. Includes J. Harrison & Son £161 12 0, J. W. Janney, Fulstow £57 10 0.

MAIDSTONE. For the supply of road materials for the Urban District Council. Mr. F. Bunting, Borough Surveyor, Fair Meadow, Maidstone —

Table with 2 columns: Name and Amount. Includes J. & H. F. Higgs £4,675 0 0, J. & H. Cocks £4,680 0 0, etc.

MAIDSTONE. For erecting retaining wall and iron fence. High Level bridge, Maidstone. Mr. F. Bunting, Borough Surveyor —

Table with 2 columns: Name and Amount. Includes W. T. Burrow £108 13 0, Weeks & Sons, Ltd. £103 12 0.

METHLEY (Yorks.) For supplying, laying, &c., flags for flagpoles, for the Urban District Council. Mr. T. Thompson, Road Surveyor, Red House, Methley —

Table with 2 columns: Name and Amount. Includes Bateman, Wyke, near Bradford £164 4 0.

PARNALL (Yorks.) Accepted for the erection of school buildings, Oatlands, near Haregate, for the School Board. Mr. T. A. Buttery, architect, Queen-street, Morley. Quantities by the architect —

Table with 2 columns: Name and Amount. Includes J. Stephenson £1,500 0 0, Walker & Sons £280 0 0, etc.

PETERBOROUGH. For the erection of Primitive Methodist chapel, Walton, for the Primitive Methodist Trustees of Walton Chapel. Mr. W. Hawkins, architect, Old Market, Peterborough —

Table with 2 columns: Name and Amount. Includes W. Pape, Cromwell-road, Peterborough £1,112 0 0.

PORT TALBOT (Wales). For the erection of a villa residence. Mr. T. P. Martin, architect, Swansea. Quantities by the architect —

Table with 2 columns: Name and Amount. Includes Wm Thomas £1,620 0 0, Dd. Jenkins £1,510 0 0, etc.

ROMFORD. For the erection of school buildings, for the School Board. Mr. Chas. Bell, architect, 3, Salter's Hall Court, Cannon-street, E.C. Quantities by Mr. J. Kennedy, 10, Gt. James-street, W.C. —

Table with 2 columns: Name and Amount. Includes Hammond & Sons, Romford £1,195 0 0, Cochrane £387 0 0, etc.

RUSHDEN (Northants.) For additions to the Conservative Club premises. Mr. H. H. Packer, architect, Wellington-road —

Table with 2 columns: Name and Amount. Includes R. Marriot £215 0 0, H. Sparrow £33 0 0, etc.

ST. MARY CRAY. For a new police-station to be erected at St. Mary Cray, for the Receiver for the Metropolitan Police District. Mr. John Butler, Architect, 1, Avenue of Art, W. H. Burgess —

Table with 2 columns: Name and Amount. Includes Latley Bros. £1,988 0 0, Higgs & Hall £374 0 0, etc.

SELBY (Yorks.) For the supply of cast-iron pipes, T-pieces, &c. for the Urban District Council. Mr. W. Curry, Surveyor, Town Hall, Selby. Quantities by the Surveyor —

Table with 2 columns: Name and Amount. Includes J. Kitchin £303 0 0, J. Blakeborough & Co. £88 9 0, etc.

SHENLEY (Herts.) For alterations and additions to Kettle's Park, Shenley, Herts., for Mr. T. H. Riches. Messrs. Benston & Burnester, architects —

Table with 2 columns: Name and Amount. Includes C. Miskin £5,335 0 0, Hall & Sons £990 0 0.

SHERBURN (Durham.) For additions to church school buildings. Mr. W. T. Jones, architect, 1, Claypath, Durham —

Table with 2 columns: Name and Amount. Includes Haue Nicholson, Sherburn £393 0 0.

SHROPSHAM (Norfolk.) For additions to school buildings (classroom for infants), for the Trustees of the Shropham Church School. Mr. H. B. Paine, architect —

Table with 2 columns: Name and Amount. Includes Hunt, Shropham £145 0 0, Mallett £158 0 0 (accepted).

SOUTHWOLD. For alterations and additions to Bee-ent for Mr. W. Cremen —

Table with 2 columns: Name and Amount. Includes J. Allen £370 0 0.

STAFFORD. For the extension of water-mains (2.60 in. dia.) from Milford to Brocton, for the Corporation. Mr. W. Blackshaw, Borough Surveyor, Borough Hall, Stafford —

Table with 2 columns: Name and Amount. Includes E. Tempest, Stafford £159 0 0.

STANDISH (Lancs.) For the supply of 400 tons broken granite macadam, for Standish-wuh-Langtree Urban District Council —

Table with 2 columns: Name and Amount. Includes Richard Briggs & Sons (Limestone) £4 0 0, Whitwick Granite Co. (Granite macadam) £11 0 0, etc.

[All of Sutton.]

* Accepted

* Accepted

• Accepted

READING CASES. I - NINEPENCE EACH.

BETHNAL GREEN, LONDON, E.

100

Particulars on Application. Chief Offices: Fitzroy Works, EUSTON ROAD, LONDON, N.W.

Particulars on Application. Chief Offices: Fitzroy Works, EUSTON ROAD, LONDON, N.W.

The Builder.

VOL. LXIX. NO. 2743

AUGUST 31, 1895.

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National Monument to Emperor William I., Berlin.—Herr R. Begas, Sculptor; Herr G. Halmhuber, Architect.....	Double-Page Ink-Photo.
Business Premises, Salisbury-square, E.C.—Mr. H. L. Florence, F.R.I.B.A., Architect.....	Single-Page Photo-Litho.
Interior, Ashton Grammar School, Dunstable.—Mr. E. R. Robson, F.S.A., F.R.I.B.A., Architect.....	Single-Page Photo-Litho.

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Recent Excavations on the Western Slope of the Acropolis.—I.

Laying before our readers an account of Dr. Dörpfeld's recent excavations on the western slope of the Acropolis, it may be well to define at the outset the nature of the various problems involved. Dr. Dörpfeld claims to have discovered the Panathenaic way. This claim no one disputes. He further claims to have discovered the site of the ancient city spring of Kallirrhoe, transformed by Peisistratos into the Enneakrunos—the Nine Fountains. His claim in this last matter is, not unnaturally, disputed; for to place the Enneakrunos where he does is to revolutionise the topography of the primitive city of Athens; it is to draw a sponge clean across the plan of the ancient agora as laboriously imagined by generations of archaeologists—nay, more, is to re-read a *locus classicus* in Thucydides. The question at issue is a complex one, we shall see, is mainly literary. The fresh material, the fresh factors introduced into the problem by the recent excavations, as illustrated by the plans accompanying this article.

Dr. Dörpfeld's interpretation of that material, the new reading he gives of Thucydides' passage, and the revised view of the topography of ancient Athens, which, by the light of his own excavations, now offers to the world.

The Orthodox View.—So long as

The literature respecting the recent excavations on the western slope of the Acropolis is chiefly to be found in the *Mittheilungen* of the German Institute at Athens, which reports appear in vols. xvi., p. 443, xvii., p. 438, and articles by Dr. Dörpfeld, with exposition of his views, vol. xviii., p. 143, xix., p. 11, and xx., p. 27. From the two last the annexed extracts are taken. To this must be added an article (modern Greek) by Dr. Dörpfeld, in the *Εφημερίς (επιστολογική)* (1894, p. 2), in answer to a criticism by *Νικόλαϊδης* (1893, p. 179). The classical passages relating to the Enneakrunos, &c., are most easily accessible in the Corpus of "Schriftquellen zur Topographie von Athen," given in the "Stadtgeschichte von Athen," by Professor Curtius, Berlin, 1894. Full reference to the few monographs that have appeared on the "Enneakrunos Episode" will be found in "Mythology and Monuments of Ancient Athens," by Harrison and Verrall, p. 87.

ancient Athens lay buried below the modern town, the picture archaeologists could frame of its topography was necessarily, in the main, a fanciful one, its probabilities depending on the interpretation of passages in ancient historians, travellers, lexicographers, &c. Of these literary accounts one—that of Thucydides—deals avowedly with the most primitive lie of the city, and is of such importance that it must be quoted in full. Thucydides (ii., 15) writes: "Before his time (*i.e.*, that of Theseus) what had been the Acropolis and the ground lying under it, mostly to the south (*καὶ τὸ ὑπὲρ αὐτὴν πρὸς νότον μάλιστα τετραμένον*) was the city (*πόλις*), and that can be proved, for the sacred places [both of Athens] and of other divinities are on the Acropolis itself, and those that are outside are built chiefly close to that part of the city, *i.e.*, the sanctuary of Olympian Zeus, and the Python and the sanctuary of Ge, and that of Dionysos in the Marshes (*ἐν λίμναις*), to whom the more ancient Dionysia are celebrated on the 12th day of Anthesterion, a festival still observed by the Ionian descendants of the Athenians. And in the same part (*ταυτῇ*) there are other ancient sacred foundations, and near at hand (*ἐγγυς οὖν*) is the fountain, now called Enneakrunos, from the form given to it by the Tyrants, but, originally, before the springs were covered in, it was called Kallirrhoe. Its water was used by the Athenians on the greatest occasions, and even now they use the water, according to the ancient custom, before marriage rites, and on other sacred occasions. To this day the Acropolis is called by the Athenians Polis, on account of this ancient settlement."

The current orthodox explanation of this familiar passage is briefly this. The old city lay to the south of the Acropolis, in contradistinction to the later agora, which, it is believed, lay to the north—roughly, where the Stoa of Attalos still survives. Existing remains seemed to fit in admirably. The temple of Zeus Olympios lies south, though very much south-east; near to this temple Pausanias saw a Python, and also a temenos of Ge, with the title Olympian. As to the sanctuary of Dionysos *ἐν λίμναις*, it was natural to suppose that it lay somewhere near the present Dionysiac theatre, *i.e.*, directly to the south. There remains the Enneakrunos, the ancient Kallirrhoe; and this was easily, and it seemed satisfactorily, placed on the Ilissus, at the spot where the women of Athens still do their washing. It is called to this day Kallirrhoe, and the

"Etymologicon Magnum" distinctly states: "Enneakrunos, a spring at Athens, on the Ilissus, formerly Kallirrhoe."

Against this view, as it seemed at first sight, there was only one objection, though, it must be admitted, a serious one. Pausanias (I., 14-1) saw and described the Enneakrunos. He saw and described it, however, not in the section devoted to the Ilissus district, which comes much later, but in his description of the agora. He mentions the temple of Ares, which is indissolubly linked with the Areopagos, and after noting the statues of Harmodios and Aristogeiton, passes to a small group of temples, monuments, &c., which he links together more or less closely. They are—

No connecting link—The Odeon.

"Near to it"—The Enneakrunos.

"Beyond this"—The Temple of Demeter and Kore, *i.e.* the Eleusinion.

"A little further on"—The Temple of Artemis Eukleia.

Where one of these is, there are the rest. To meet this difficulty was invented the theory of the "Enneakrunos episode." It is supposed that Pausanias, without a hint of warning, wanders off half-a-mile, and plants his readers suddenly down on the banks of the Ilissus, whence he as suddenly returns to finish the agora buildings. It must be distinctly understood that this Enneakrunos episode is the purest hypothesis, invented solely and entirely to keep the Enneakrunos on the Ilissus. It is a deliberate sacrifice of Pausanias—a favourite scapegoat—on the shrine of Thucydides. Pausanias, whatever his other shortcomings, is at heart an orderly sight-seer, as the Delphi excavations have abundantly shown, and there is no evidence whatever of dislocation of the text. The difficulty is, however, undoubtedly a grave one. Thucydides seems to say the Enneakrunos lies to the south of the Acropolis. Pausanias, unquestionably, unless he made a sudden leap to the Ilissus, saw it to the west: both are credible witnesses. Dr. Dörpfeld offers a solution, but this must wait over till we have considered—

2. *The Fresh Material Yielded by the Recent Excavations.*—Dr. Dörpfeld has always refused to argue except with the spade; other archaeologists might draw up fancy plans of the Panathenaic Way, the agora, with the Stoa Basileios, the Bouleuterion, the Eleusinion &c., conjecturally marked in, but his views remained unpublished. To quote his own words: "It seemed to me purposeless to add another

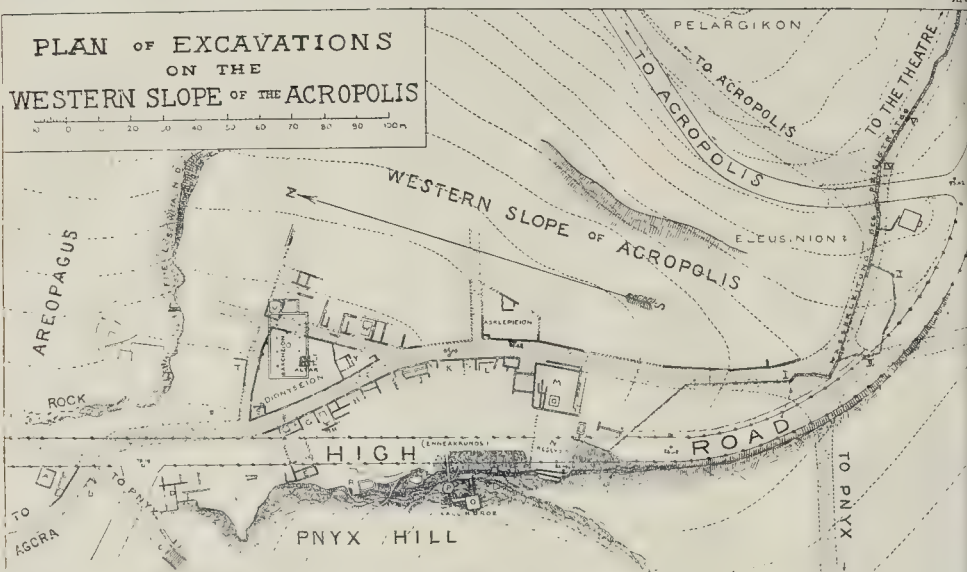


FIG. 1.—General Plan of the Site and the Excavations.

to the many theories about ancient Athens, so long as the site itself remained ininterrogated, and not even an attempt had been made to find the actual buildings in question." In his public lectures, however, at Athens he repeatedly stated his views, both as to the direction of the Panathenaic Way and the position of the Enneakrunos, the two main factors with which all the other minor attributions are involved. By his permission, these views appeared in English form in the book on the mythology and monuments of Athens cited in the footnote on last page, and the plan of the agora published there, though it requires modification in detail, remains as a record of his prophecy; whether that prophecy has been fulfilled by the excavations our readers must judge.

Tentative excavations were begun as early as 1887 with a view to fixing the lie of the agora. The site chosen was to the west and north-west of the Areopagos, but the results were not encouraging; a portion of the road leading to the Piræus gate came to light, and the ground-plan of some buildings was discovered, but, owing to the narrowness of the trenches dug they could not be satisfactorily made out. The work was begun again in 1892, but still pursued under great difficulties; the private owners of particular plots of land would only allow excavations to be made on the express condition that the trenches were levelled up again; moreover funds were limited, and work under these conditions both slow and costly. The results were, however, of manifest importance; the ancient road from the Agora to the Acropolis was unmistakably made out, a building inscribed as a Lesche came to light, several private houses, the precinct of a god of healing, the place of assembly of the Iobachoi with beneath it an ancient sanctuary of Dionysos, and finally the remains of an important fountain to which at present we will give no name. Besides these ground-plans, a number of sculptures and inscriptions came to light, and the Greek Government was at last so impressed by the discoveries that it decided to appropriate the whole of the west slope of the Acropolis, and to hand it over to the German Institute for investigation. The funds necessary for last winter's and the coming season's work were raised by private subscription in Germany.

Turning to the plan, first and foremost we note marked in dotted lines the ancient road to the Acropolis, the famous Panathenaic Way. It can hardly be doubted that we have here the ancient main road to the citadel: it follows roughly the course of the modern road; it is the natural way of ascent to the Acropolis, as natural in 500 B.C. as in 1800 A.D., and yet, by almost a consensus of imaginative archaeologists, that road was misplaced and made to run to the north of the Areopagos round its east end by a short but to this day impracticably steep cut. The reason of this error is worth noting. Any professional road-maker, any engineer inspecting the site, would have told at a glance where the ancient road must run if chariots were to ascend in comfort by it. But the archaeologist of the last generation was apt to make his plans at home. He was misled by the fact that the only extant agora buildings, e.g., the Stoa of Attalos, the Stoa of the Giants, the Gate of Athene Archegetis, the Stoa of Hadrian, lay to the north. To work in some or all of these into his scheme of the ancient agora, to get his Panathenaic Way to pass them, he sacrificed all such commonplace considerations as convenience of ascent. These buildings have, indeed, to be reckoned with; but for the late commercial Roman agora, not for the primitive city market-place. Their date forbids that.

To return to the ancient road. The first impression is of extreme narrowness, just as at Delphi on the other Sacred Way. It is a narrow Oriental street hemmed in by buildings and sacred precincts, and bounded on either side by walls of polygonal masonry. These were originally, of course, in sight, but as the level of the road rose they gradually disappeared. It is owing to this that in places (marked on the plan, Fig. 1, in black) they are still well preserved. The excavating of the road has been attended with unusual difficulties, because, in places, it borders closely on the modern road, and traffic could not, of course, be suspended. Beneath the road an elaborate system of drainage-pipes has come to light—with shafts by which they could be entered for cleaning purposes. All this complex subject Dr. Dörpfeld proposes to discuss later. Several cross-roads in connexion with the main way are clearly made out and marked on the plan; thus to the left (Fig. 1) is a

road up to the Pnyx, and to the right a second road in the same direction. Just at the point where this branches out was an important crossway, the main road passing on to the Acropolis, another branch to the Itouian Gate. On the left-hand side (of the road) various smaller ways branch off; one to the Areopagos, one right round the precinct of Dionysos, another a foot-way straight up to the Acropolis. It is by the foot-way Dr. Dörpfeld thinks that the Athenian maidens came and went to draw water from the spring Kallirrhoe.

Our description of the buildings laid bare may best begin at the northern end of the road (to the left of Fig. 1). We take the west side first. Walls of Greek date are marked black, later structures are drawn in with double lines. At B, two walls of polygonal (limestone) masonry forming an angle mark distinctly where a road branched off to the Pnyx. The further course of this road is clearly shown by the steps which occur at C. From B to F the direction of the main road is more or less conjectural, as the excavations at this part could not be completed, owing to the modern highway. The building marked D, presumably a private house, helps to fix it, as in all probability it faced the road. Certainty begins again at F where the old polygonal boundary-walls reappear and continue in good preservation for a considerable distance. At F, we come upon buildings that from inscriptions can be certainly dated as of the sixth and fifth century, B.C. These consist of an open exedra, quadrangular in shape and of polygonal masonry. Inside this precinct is a small shrine with no columns, in front of it a round altar of porous stone. Both material and technique point to the sixth century B.C. To whom the shrine was dedicated is not known. In the course of the next century the little sanctuary must have fallen into disuse. As the level of the road rose, it, once disused, would easily get covered up. That this was actually the case is clearly shown by the fact that a building of the fourth century B.C. was superimposed; it extended right back to the Pnyx rock, and is marked E. Two boundary stones of this later building are still *in situ* in the wall

* The general lie of the Panathenaic Way is best seen in Fig. 1. Additional details of certain buildings will come out more clearly in the enlarged plan of a portion of the site, to be given in our next issue as Fig. 2.

bordering the main road; on each is inscribed HOPOΣAEXXHΣ , so the later building is known to be a Lesche.

Immediately next to the south (G) comes a building of polygonal limestone masonry; two inscriptions show that the building was mortgaged, and must, therefore, have been a private house. At H we come to a building of good Greek masonry and extensive size, twenty-one mètres long. Its ground-plan has not yet been fully explored, but its extent would seem to indicate rather a public than a private structure.

At J, K, and L the walls of a private house of late Roman date, have come to light. It occupied the whole space between the Pnyx and the main road. It was discovered after the drawing of the general plan, Fig. 1, and, therefore, does not appear there, with the exception of just the portion that borders on the road. The house consisted of a large atrium with a peristyle of twelve columns and several small chambers surrounding it; the walls are a patchwork of materials of all kinds, and even the bases of the columns are made up of fragments from other buildings. Below this building an earlier structure came to light, a building consisting of only one chamber, and dating from late Greek or quite early Roman times. In the front wall of this building a stone appears bearing on its side a boundary inscription of the fourth century B.C.; the inscription names a certain Aristodemus of Aphidna as holding a mortgage on the house. Probably this stone does not belong to the building, but was used up from an earlier structure. We cannot, therefore, rely on it for any attribution.

Between this building and the Pnyx rock is a space measuring about 40 by 20 mètres, connected with the main road by an entrance way nearly 10 mètres broad. This is the space occupied in Roman days by the large atrium, and it is here that Dr. Dörpfeld places his Enneakrunos. As we are for the present stating facts only, we must be content to mention that at this point the excavations, when the plan was drawn up, were not completed. They can only be carried on slowly, with great difficulty, and by instalments, as the modern road, planted with trees to either side and in constant use for traffic, passes directly over part of the site.

Setting aside theory—what evidence have we from the excavations of a great system of wells and water-courses at this spot? First, no less than twenty wells have been found close at hand; the excavations were again and again stopped by the standing water, and anyone who visits the site after weeks of drought may still see, with their own eyes, pools of stagnant water. Next, deep in the rock of the Pnyx is a chamber, O, accessible by steps from the modern road, and from O a passage leads down by steps to P, where the water may still be drunk from a standing well. In the back wall of the chamber is a deep niche with an ancient well, in front of which is a basin for water. In winter water still issues from time to time from the rock. In Roman times a pipe leading from the supposed "Enneakrunos" reinforced the water supply.

So far we have evidence of a primitive local water supply adequate for the needs of the ancient citadel, and immediately in front of its gate. Of an artificial water supply brought from a distance in the sixth century B.C. the evidence is still more striking. On the right-hand of the plan is marked the conduit (Wasserleitung) of Peisistratos. This has been distinctly traced from its source in the upper bed of the Ilissos right down to the basin N, into which it debouches. It passes deep down below the Palace gardens and skirts the southern slope of the Acropolis. The exact place where the conduit issues from the Acropolis rock is now determined. The entrance was found about 70 mètres south-east of the basin N, just at the spot where the modern road curves to the east. The portion between the Acropolis and the basin N consists of great porous blocks forming a subterranean

but accessible canal. From this issue two systems of pipes; the larger, with an inner diameter of 0.19 to 0.22 m., conducts the water underground to the basin N; the other, with a diameter of only 0.12 to 0.14, the end of which is not yet made out, seems to have supplied the Asklepieion. The separate pieces of the pipes are from 0.60 to 0.61 in length, not counting the junction points; they consist of a fine yellowish clay; inside they are protected by a red glaze, outside left rough, excepting that at each end they are glazed, and have two lines of glaze down the middle. The separate sections are soldered together with lead, and provision is made for cleaning them by an elliptical-shaped opening with a cover. It is remarkable that these pipes present the closest analogy to the pipes of the famous aqueduct built by Eupalinos, of Megara, for Polycrates, in Samos. Those interested in this technical question will find these pipes fully described by E. Fabricius in the "Mittheilungen," vol. ix., p. 175, in an illustrated article to which, at the time, we drew attention. One thing is quite clear, that the conduit discovered is, by the character of these pipes, as well as by its masonry, fixed beyond doubt as belonging to the sixth century B.C. Many fragments of the pipes still lie scattered about the excavations. In quite early days these pipes seem to have got crusted with lime deposit from the water—and, indeed, choked up; the water then flowed over the pipes and flooded the main channel to two-thirds of its height; in some places where the rock was soft it seems to have got worn away and fallen in, and portions of the tunnel became useless. New borings were made for about 30 mètres, and new pipes put in; these were quadrangular instead of round, but in the disused portion of the tunnel the old round pipes still lie about.

A further very important point is that, just as at Samos, above the main aqueduct a second tunnel has been bored, and the two communicate at several points: whether they were made at the same time is not clear, nor is the purport of the second tunnel as yet made out.

At intervals of from 30 to 40 mètres both tunnels alike are provided with shafts, which served, when the tunnels were first made, for the clearing away of the rock fragments, and were made use of for the like purpose when the conduit was excavated. These shafts are sunk perpendicularly, and reach up to the surface of the earth: one of them was as deep as 12 mètres, so far below the ground did the conduit lie. At Samos similar shafts have been discovered.

From the main conduit several branches can be traced; they probably occur at places where, in the piercing of the tunnels, veins of water were reached, and they seem to have served to bring to the main conduit subsidiary supplies from the Hill of the Muses and from the Acropolis. It is possible, however, that some of them served to conduct water away from the main conduit.

Only those (as Dr. Dörpfeld remarks in his report) who have taken the trouble to get right down into these tunnels and cross-tunnels, and explore them thoroughly, can form any idea of the magnitude of the work. Sometimes it is possible to stand upright; some portions can only be reached by creeping on the hands and knees; one fact is beyond question, and that is, that in this system of conduits we have what was unquestionably the main artificial water-supply of Athens. Complete plans of the whole system will be issued when the water-course has been entirely explored. So far the tunnel has been followed up to the Theatre of Dionysos, where it runs between the two temples. At this point also its course has been altered in Roman times.

At its other end, the conduit debouches, as mentioned above, into the basin marked N. Here, again, we have to do with an earlier structure and a later Roman reconstruction. The exact size of the original basin, which was much the smaller, cannot now be deter-

mined. In early Roman days it was enlarged and deepened, but the exact size of the Roman structure has not been ascertained. The floor of the basin was sunk nearly 1.50 mètres lower, and the like alteration was necessarily made in the pipes for carrying off the water. The exact date of the change cannot be known, but it was considerably previous to the building of the late Roman villa, as at that time the great reservoir had fallen into disuse. The water from the aqueduct, not being needed in any large quantity for the well-house, was carried by pipes to the lower city for the supply of the new Roman marketplace. These alterations as to water supply are of the first importance in questions of topography; a change in the direction, or the extension of an aqueduct, is naturally the index of a shifting of population. That this basin, N, was once the reservoir to an important public fountain cannot, then, be doubted: the existence of the modern carriage-road prevents it being completely explored.

The space immediately adjoining the reservoir, N, was occupied, as has been seen, by a large Roman house. The question naturally arises, did this Roman house supersede an earlier building? If so, we may expect to find fragments of the earlier building built into the later. Just such fragments have been found. They consist in part of large blocks of porous stone, of which one contains a spout for water, with two openings to it, and covered with a coating of chaux deposit, exactly similar to that seen in the water-courses of modern Athens—in part of blocks of a particular sort of limestone, found in the village of Kara, at the foot of Mount Hymettus. This special limestone was much used for stylobates, and the foundations of buildings in general, in the sixth century B.C. One of these Kara limestone blocks, Dr. Dörpfeld conjectures, belonged to the pavement of the fountain-house; another, from its shape, and from the fact that it bears traces of the constant trickling of water, must have served some purpose in relation to the spout; probably it was a structure like that seen on vase paintings, which received the droppings from above. In one block the T-shaped clamp appears, an infallible sign at Athens of early masonry. All these stones were built into the walls of the Roman house, and quite recently one came to light which is, as it were, the apex of the argument—a large limestone block, in which, obviously, from the outline still clearly to be traced, a lion's head 0.34 m. in size had been inserted. A lion's head was a favourite spout among the Greeks. A well-house then once certainly existed, this much is sure; it is, of course, another question whether that fountain-house was the Enneakrunos.

It only remains to note that the place where the fountain-house once stood was separated off from the building M, Fig. 1, (which lies considerably higher) by an early polygonal retaining wall. M, from the style of its masonry and its mosaic pavement, belongs certainly to Roman times. Whether it was a private or a public building remains uncertain.

(To be continued.)

NOTES.

THE fire service of our country, taken as a whole, has the short-sighted policy of considering that its only duty is to extinguish fires with rapidity; and, as we have often, unfortunately, had occasion to remark, even this fire-fighting is generally carried out in a most rough-and-ready fashion, without consideration of economical principles, theory, and tactics. On the Continent, though the respective departments are not, as a rule, well equipped, protection from fire is making rapid strides on account of the careful co-operation of the service with architects and engineers, and the systematic way in which things are generally managed. It has now been decided to hold a Fire

Congress at Amsterdam next month, at which ample opportunity will be given for the mutual discussion of various important subjects between firemen and members of the technical professions. Instead of the more usual fire brigade tournament and merry-making, this gathering will be held on similar lines to the meetings of scientific societies. There will be three sections: (1) Fire Prevention, (2) Fire Combating, (3) Fire-resisting Construction, and each division has a number of sub-sections. An influential committee has charge of the arrangements, under the presidency of Captain Meier, of the Amsterdam Brigade, and the patronage of the Dutch Home Secretary and the Mayor of Amsterdam. Among the foreign members of the committee we are glad to notice Mr. T. Blashill, F.R.I.B.A., who will represent English architects, together with Sir Eyre M. Shaw, and other recognised English authorities on practical fire brigade matters. Dutch architects and engineers are represented on the committee by the Presidents of their respective Institutes. Mr. Blashill's paper, we understand, will be on his new London fire-stations, which are far superior to the Continental ones, and hold their own with the American dépôts.

IN our opinion, the importance of the granary fire on Hanbury's Wharf, near Blackfriars Bridge, which occurred on Saturday night, is being much overrated by our daily contemporaries. We notice that even the *Times*, a paper which seldom takes much notice of our fires, devotes a column to its description. The *dilettante*, as usual, is more interested in the brilliant blaze on a conspicuous site, than in the more serious side of a catastrophe, which is not so easily seen, and he prefers a showy spectacle of fire brigade work, quite regardless of the results. This conflagration was merely an example of a granary fire on a practically isolated site. There was no wind to fan the flames, but the premises almost appear to have been carefully constructed to facilitate the spread, and this, although we understand them to be of recent date. The result was that the block was nearly completely gutted before the fire brigade could attend in proper force, and the firemen only had to see to the protection of the adjoining property—in this case a comparatively easy task. As usual, we again have an example of the advisability for strengthening our Fire Brigade, more especially in the dangerous part of London, so as to enable a more rapid concentration of a force in cases of emergency without seriously interfering with the protection of the West End and the suburbs, and we again see the results of bad planning and unsuitable construction in dangerous premises. We wonder that, where the Building Act cannot prevent such risks, its place is not taken by strictures from the insurance companies. The latter may not care to assist in the suppression of small fires, as these are known to serve as an advertisement of the ever-existent danger from fire, and bring the companies new business; but the larger conflagrations must occasion losses, which call for some energetic preventive policy on their part.

IT is stated in the *Times* that the house in Chelsea, wherein Turner, leaving his house in Queen Anne-street, Cavendish-square—No. 47 in his time, but lately re-built as No. 23*—lived in retreat during some years, is about to be pulled down. It is No. 119, one of two, at the remoter end of Cheyne-walk, and nearly opposite Lindsey Wharf. The house, set back from the road, has stone steps descending about two feet to its front garden, and an iron balcony on the coping, placed there by Turner himself, who from the roof of this house as well as from the vestry window of St. Mary's, Battersea, used to sketch the sun-sets and

landscape effects across the river. He was locally known as "Admiral Booth," or "Puggy Booth," having given the name of "Mrs. Booth" (that, according to one story, of his house-keeper in Queen Anne-street) to the landlady. Here, his identity unknown save to one or two intimate friends, he was discovered by his housekeeper, being then at the point of death, and died on the following day, December 18, 1851, in the front room of the second floor, to the window of which he had been taken, during his last illness, day by day, that he might see the winter scene on the Thames. Whilst at Chelsea Turner had for neighbour in 1846-7, William Dyce, R.A., at No. 4, Cheyne-walk, the house occupied by Macleise for nine years before his death there in 1870, and during December, 1880, the last home of Mrs. J. W. Cross (George Eliot). The old weed-grown river wall of Cheyne-walk, so loved by Turner, with much of the walk, have given place to the new Embankment, begun in 1872; but many of the prospects here are preserved to us in paintings by Peter de Wint, John Varley, C. J. Lewis, and Cecil Lawson. The last-named lived at No. 15, Cheyne-walk (next door to D. G. Rossetti, at No. 16, "Queen's House"); of his local pictures we may mention "Cheyne-walk, 1870," and "Chelsea Embankment, a Lament," 1872.

CONSIDERABLE damage was done to the roof, the east windows, and other portions of the building by a fire that broke out a few days ago at Appleby Castle, Lord Hothfield's seat. The castle is of ancient origin; it stands in the midst of some earlier earthworks of great size and extent, and together with those of Brougham, Pendragon, and Brough, in the same county, was held by Ranulph de Meschines, lord of the barony of Westmoreland, who in 1088 gave to St. Mary's, York, the churches of St. Lawrence and St. Michael "castelli mei de Appelbi." The keep, popularly known as "Cæsar's Tower," and having an inner and an outer ward, was erected in the beginning of the twelfth century. It is 46 ft. square, about 80 ft. high, and had a vaulted basement, lighted by loopholes and containing a deep well, with three floors above. The battlements and angle-turrets, later in date, were repaired about thirty years since. The buildings to the south-east are attributed to Robert de Veteripont, to whom King John gave Appleby and Burgh; he died in 1228, and was buried in the Temple, London. His great-granddaughter Isabella brought the property in marriage to Roger de Clifford, who rebuilt Brougham Castle. Their descendant John de Clifford, seventh baron, and his son Thomas, built the gate-house, chapel, and hall (1418-54). The castle, dismantled by the Scots, and left in neglect for many years, was repaired by Anne, the famous Countess of Dorset, and Pembroke and Montgomery, daughter and heir of George Clifford, third Earl of Cumberland. She made it her residence, and altered the keep by placing a wall up the middle, and putting new stairs in two of the angle-turrets, 1651-3. She placed a garrison here under command of Sir Philip Musgrave on the outbreak of the Civil War, but the castle was ultimately surrendered to the Parliamentarians in October, 1648. The Countess died at Brougham Castle on March 22, 1675, and was buried in the chancel of St. Lawrence, Appleby, where is her marble monument with effigy. Her daughter and heir married John, Lord Tufton, who succeeded his father as Earl of Thanet. Thomas, sixth Earl of Thanet, removed the chapel and some other buildings for new private apartments, 1695, using materials from Brough Castle. In 1831 Sir Henry Tufton, Bart., was elevated Lord Hothfield; two years afterwards he built two additional stories over the old "Baron's solar," or chamber. It is stated that none of the valuable pictures and muniments have, fortunately, been injured by the fire; the pictures comprise portraits of the Countess Anne, John, Lord de Clifford

(Black-faced Clifford) slain at Towton, and several members of the Clifford, Russell, and Tufton families. In the Pembroke MSS. is an account, by the Countess, of all the repairs she carried out at Appleby; for her love of building, and her various residences in this part of England, she might not inappropriately be compared with Bess of Hardwick, who died in 1607.

THE case of Kershaw v. Taylor exposed a curious blot on the Metropolis Management Acts. By the Act of 1855 the duty of repairing sewers lies on the Sanitary Authority, that of repairing drains on the owner of the house, and by the same Act a drain which, without an order of the Sanitary Authority, drains more than one house, is a sewer. In the case under notice, a builder in 1887 built four houses, which he, contrary to the directions of the Sanitary Authority, but without their knowledge (a proper system of drainage having been sanctioned), caused to be drained into one drain. He subsequently sold the houses to different purchasers. The Sanitary Authority later on took legal proceedings to compel the purchaser of the house in which the drain which received the drainage of the several houses was situated to repair it in consequence of its defective condition. Both the Court and the Magistrate from whom the appeal came decided that as the drain was a sewer within the definition of the Metropolis Management Act, 1855, the Sanitary Authority could not compel the owner to repair it. "Here," said Mr. Justice Wright, "the thing is actually a sewer within the definition clause." Consequently, as the Judge again remarked, "the Local Authority are without a remedy." The wrongful act of the builder in the first instance had really placed the subsequent owner of the house in a better position than he would have been in had the builder obeyed the law. On the other hand, it is to be observed that, had the Sanitary Authority exercised a careful supervision over the drainage of the houses when building, they would have seen that the system which they approved had not been carried out, but in its place a faulty and improper system. The necessity for careful supervision of building operations is, therefore, shown to be absolutely necessary, even when a proper system of drainage on paper has been approved.

THE sanitary condition of Ilfracombe, Barnstaple, Bideford, and Clovelly, is the subject of a report by Dr. R. J. Reece to the Local Government Board, giving a great deal of information as to the sanitary condition of these places, which may be of interest to the numerous holiday visitors to North Devon, as well as to permanent residents. Ilfracombe appears to be pretty well looked after by its Sanitary Authority in general, though its water supply, derived from a stream liable to pollution by cattle above the intake, is not immaculate. At one of the hospitals there is no administration block, and the nurses have to sleep in the ward or in the unoccupied ward in direct connexion with it. Dr. Reece pointed out the danger, in diphtheria cases, of allowing the nurses to sleep in the infected atmosphere; and since he gave the warning, no less than four nurses have been attacked. Barnstaple appears to stand well in regard to water supply and its modern drainage and sanitation. There are old and badly-formed drains still down, which are, however, being removed by degrees. At Bideford the water supply is from a collecting area of pasture lands, where the water is very liable to pollution, but appears to be fairly filtered. The town was sewered twenty-three years ago on plans prepared by Mr. Baldwin Latham: the drawback to its drainage system is the existence of catch-pits to collect the solids of the sewage, which are deposited in putrefying masses in these catchpits; they are supposed to be cleaned out once a week, but it appears that this is not systematically attended to. In the villages in the Barn-

* The Portland estate office: marked by a commemorative tablet.

staple Rural Sanitary District the sanitation, especially as to the removal of refuse, appears to be in an unsatisfactory state as it still is in the majority of rural districts. Clovelly, however, appears to have an exceptionally good record in this respect; there is a public scavenger, and ash-bins are emptied three times a week in summer and twice a week in winter. We have again and again urged that in rural districts strict official supervision and action is necessary to ensure attention to sanitary observance, and Clovelly seems an instance of the good effect of such supervision.

VERY elaborate report on the causes of a recent prevalence of enteric fever at Newport (Isle of Wight) has been furnished to the Local Government Board by Dr. Theodore Thomson. It is illustrated with maps and photographs, and contains the record of an exhaustive investigation made with a view of tracing out the real causes of the prevalence of the disease. Dr. Thomson finally came to the conclusion that the only possible cause that was continuous in its influence with the spread of the illness was the water-supply. The drainage of the district has indeed many defects, but the possible influence of these did not coincide with the spread of the illness, and attention was therefore concentrated on the water-supply. This, in the borough of Newport, is mainly from a low-lying reservoir, filled from springs which rise through the bottom of the reservoir and are there impounded. Near this reservoir are many houses draining into cesspools in the chalk formation from which the springs arise, the cesspools being so constructed as to permit leakage of their contents.

"The general trend of the underground water in the chalk in the Carisbrooke Valley would appear to be from the south-west to the north-east, and water flowing on this line towards the waterworks would counter in its way some of the leaky cesspools referred to. Besides this, however, it has to be borne in mind that the effect of pumping at the waterworks would naturally be to draw thither underground water from points not in the direct line of flow towards the waterworks, and the cesspools in any wider area thus drawn upon would constitute a further danger to any water-supply."

Some further details as to special causes of pollution are given, and the report sums up by drawing attention to these circumstances as affording a fresh instance of the dangers attaching to a water-supply from the chalk beneath the soil of the area from which it is drawn is liable to pollution by sewage matters.

THE good people of Ventnor are very much troubled about the security of the spire of St. Catherine's, the parish church, the upper part of which has long been out of the perpendicular, like the well-known spire of Chesterfield. The church is an ordinary specimen of the poorest Gothic style, that of but fifty years ago, and both it and its tower are covered with stucco and composed of one of those persons who were employed erecting it, called it publicly, last week, "a dry-built structure." At a vestry meeting, held last Monday, the safety of the spire was discussed, when one or two local builders expressed an opinion that, though far from true, the spire was in no immediate danger of falling; and a general opinion prevailed that it would be wise to take down and rebuild the topmost 18 ft. or 20 ft. at a cost of but 200l. The Vicar stated that the sinking of the spire had increased gradually during the last three years, and reminded the meeting that every gale augmented its deviation from the perpendicular. Some of the fashioners present, however, expressed an opinion that a slight repair of the tower would be of little use, and that the best plan would be to take down both the spire and the tower, and to place in their stead a new peal of bells, which would be a real addition to the town. Eventually it was decided by the meeting that the work of pulling down and rebuilding the most twenty feet of the spire should be

undertaken and commenced forthwith. It may be questioned, however, whether it is wise to spend money on the erection of a spire in a town like Ventnor, where any such structure is of necessity dwarfed by Nature, both St. Catherine's and St. Boniface Downs rising several hundred feet above the top of any steeple that can be built; and it is certain that if a peal of bells is to be put up, it is the security and solidity, not of the spire, but of the tower which supports it, that must be looked to first.

THE special technical office which was formed at Vienna last year, to take charge of the extensive street improvements decided on by the authorities, has now completed the plans for covering in the River Wien and forming an important thoroughfare from the Schönbrunn Palace to the City Park. The distance under consideration is about three miles, and the thoroughfare will also be the line for the new Metropolitan Railway, which is to be run in a cutting. We are pleased to see that quite as much attention is being given to architectural effect as to the more practical side of the scheme, and we have every reason to believe that the proposed thoroughfare will be a great success. A number of open spaces are being formed on the route, and old ones are being remodelled. One of the greatest improvements is in connexion with the Carl's Church, which will now have an imposing aspect; and an extensive square is also being planned in front of the Technical College. The Schwarzenberg Place will be made symmetrical, and the Beethoven Place extended. The width of the new thoroughfare will vary from 200 to 300 ft., and its section at the principal points will mostly show a main roadway of 50 ft. over the river (which is being covered in), with the railway cutting (25 ft.) on the one side, and a "Rotten Row" (16 ft.) on the other. Smaller roadways for heavy traffic (40 ft. each), a broad promenade, and the usual footpaths on the frontage line, complete the width. At some points on the route the promenade, or the Rotten Row, will, however, have to be entirely omitted, the dimensions of the side roadways diminished, and the cutting widened to allow for the station platforms. The City Architect, Herr Berger, is responsible for the scheme, which is in charge of Messrs. Winkler and Mayreder, of whom the latter is the chief architect and the former the civil engineer of the department.

ROMAN remains in France, those of theatres at least, seem to be in considerable danger. We mentioned some little time since the existence of a scheme, favoured by the French Government, for repairing and "doing up" generally the ancient theatre at Orange, and making it a site for the annual representation of leading dramas of the classic age of French literature, the object being to make it a kind of rival to Bayreuth. It appears that the inhabitants of Arles are jealous of the preference shown to Orange, and demand that their Roman theatre rather should be repaired, "restored," and devoted to modern drama. They allege that their theatre is of as much archaeological interest as that at Orange, and is in better preservation. This seems to be regarded as so much the better reason for destroying all its archaeological value and vulgarising its associations.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

An Irish district meeting of the Incorporated Association of Municipal and County Engineers was held in Londonderry on Friday and Saturday, August 23 and 24. Mr. E. R. S. Escott, President of the Association presided, and amongst those present were Messrs. H. P. Boulnois, Liverpool; T. De Courcy Meade, Manchester; E. Pritchard, Birmingham; W. Weaver, Kensington; J. Low, Hampstead; J. Cooper, Wimbledon; R. Godfrey, King's Norton; Cooke, Lancaster; Stubbs, Darwen; Wardle,

Longton; Shaw, Crewe; Thomas, Bedford; J. Cartwright, Bury; J. Lobley, Hanley; Price, Toxteth Park; Smith, Carlisle; Smith, Dalton-in-Furness; Creer, York; and others.

The Mayor (Alderman J. Bell) first briefly but heartily welcomed the Association to Londonderry.

The President proposed a vote of thanks to the Mayor, which was seconded by Mr. H. P. Boulnois (Liverpool), and adopted.

On the proposition of Mr. Sanders (King's County), seconded by Mr. Moore (Meath), Mr. R. H. Dorman, County Surveyor, Armagh, was unanimously re-elected Secretary for the Irish district.

Mr. J. Christie, City Electrical Engineer, then read a paper on the Electric Lighting of the City of Londonderry. The question of electricity supply, he said, both for public and private engineers, had now become of so much importance to municipal engineers, that when he was asked to contribute something to the meeting of the Association, he thought he could not do better than give a brief description of the generating-station, with details of the scheme adopted for the public lighting of Londonderry. In 1893 the Corporation decided to adopt a scheme for the public lighting of the city by means of arc-lamps. The scheme prepared by Mr. Blake was submitted to Dr. John Hopkinson, and, on his approving of the specification, a grant was obtained from the Local Government Board to borrow the necessary estimated capital of 15,000l. At present there were two boilers laid down. They were supplied by Penman, of Glasgow, and were of the Lancashire type, 26 ft. long and 7 ft. in diameter, constructed for a working pressure of 125 lbs. per square inch. The feed-water arrangements comprised two duplex double direct-acting pumps, each capable of supplying 900 gallons per hour against the maximum working pressure. The economiser was one of Messrs. Green's, and consisted of ninety-six 4-in. tubes 9 ft. long. The steam was conveyed to the engine-room by two lines of 9-in. wrought-iron pipes having 6-in. branch-pipes to each boiler. In the engine-room were placed along one side three vertical compound condensing-engines of 150 indicated horse-power, made by a local firm of engineers, Messrs. Brown & Sons. The diameters of the cylinders were, high pressure, 11 in.; low pressure, 22 in.; and the stroke, 18 in. The average speed at which they were run was 145 revolutions per minute. Each engine had a jet condenser of its own, placed under the floor of the engine-room, the air-pump being operated off a crank disc on the end of the shaft. The condensing water was supplied to each engine by a separate 4-in. cast-iron pipe laid direct to the river, each pipe being fitted with a clack valve, rose head, and mud box. A 9-in. cast-iron pipe served as a common discharge to all the engines. An auxiliary injection-pipe off the town mains was provided to each engine to assist at starting if the tide was very low or a suction-pipe got choked. The speed of the engines was controlled by Hartnell's patent automatic expansion governor fitted on the crank shaft, which by shifting the angle of advance of the high-pressure eccentric, varied the cut off of the valve to suit the load. The distribution of steam was effected in the high-pressure cylinder by a piston valve admitting the steam in the middle and exhausting at the outer edges, and in the low-pressure cylinder by an ordinary trick slide valve; by this arrangement the high-pressure piston gland was the only one which was subjected to the full working pressure. Each engine drives two dynamos placed on sliding rails one behind the other. The dynamos were of the constant current series type made by Messrs. Siemens Brothers & Company, Limited, London. They were designed for an output of 10 amperes at 3,000 volts at 750 revolutions per minute. They had had them running constantly for nearly forty-eight months, at 2,500 volts, and often had them subjected to the most severe strains possible, and they had given no trouble whatever; the sparking was not excessive, and the wear on the commutators very small. To keep the current constant a very ingenious regulator was provided, which automatically varied the voltage to suit the number of lamps on circuit by rocking the brushes back or forward; with these regulators in gear, it was almost impossible to get more than ten amperes for any time, and they gave the current just as well on short circuit as when the whole resistance of the circuit was on. From the dynamos the current was led to the switchboard by means of insulated cables laid in trenches under the engine-room floor. The switchboard was arranged for six dynamos, and four circuits, and was provided

with short circuit field switches, double pole fuses, and a Swinboure electrostatic volt-meter, to each dynamo, each circuit having a Siemens' ammeter double-pole fuses, and a Thomson-Houston, lightning arrester on each end. The lighting of the city was divided into two sections, each section having two circuits with lamps arranged alternately on different circuits. The cables consisted of $\frac{1}{4}$ copper strand heavily insulated with vulcanised India-rubber served with a covering of bituminised jute armoured with galvanised steel wires, the whole being covered with jute steeped in a preservative compound, and laid in the ground direct. The armoring was earthed at every lamp, and also at the station ends. There were thirty-four miles of this cable laid, the longest circuit being about nine miles round, and the area lighted was one of the largest in the country. During the first six months, after the plant was taken over by the corporation, they had a most unfortunate time of it, through failures of the lamps, cut cables, and other causes incidental to the start of such a large scheme. For a long time this made the electric light most unpopular with many, but Messrs. Siemens successfully surmounted all the many difficulties as they cropped up, and in the very depth of winter entirely relaid the whole of the cables without interrupting the lighting of the city. All these failures were happily a thing of the past, and now they rarely had even a single lamp failure reported. All the lamps were of the well-known Brockie Pell double carbon 32 hour type, so that in winter they only required trimming every second day, whilst in summer once a week sufficed. Each lamp had fitted within itself a cut-out, which, should the carbons burn out, or the rods hang up from any cause, automatically cut the lamp out from the circuit and formed a by-pass for the current to go on to the next lamp. The lamps are fixed on ornamental cast iron pillars 25 ft. high, and pitched from 75 yards to 250 yards apart. In the base of each pillar, inside a locked door, an isolating switch is provided by means of which any separate lamp might be extinguished quite independently of any of the others on the same circuit. Daily insulation resistance tests of all the circuits were taken, and if any one showed below the normal it was carefully watched, should it become dangerously low; the position of the fault was first roughly located by means of a Kelvin electrostatic volt-meter of the ordinary type, reading up to 6,000 volts. One terminal of the instrument was then earthed, and the other terminal connected to the positive and negative ends of the faulty circuit, and two readings obtained, which, assuming the voltage per lamp at 50, read directly the number of lamps from either end about which the fault existed. By referring to the map, they could at once go to almost the exact lamp, and by freeing the ends at the switch, tell, by means of a detector, whether the fault lies in a lamp or a section of the cable between two lamps. This method saved an immense deal of trouble, rendering it unnecessary to split up a long circuit into several parts until the faulty one was found, and if the readings were carefully taken they could always spot the section within two lamps either way. The cost of the whole scheme up to the present amounted to between 18,000*l.* and 19,000*l.* The end of the financial year was not up till November, and he regretted that he could not now give them the exact cost of the public lighting. In winter, during the long nights, the works cost per lamp hour as low as 65*d.*, and in summer, when the run were shortest they reached as high as 170*d.* per lamp hour. So far as could be judged the total costs, including everything, should not much exceed 10*d.* per annum, which, considering the number of hours they run, was by no means excessive. No attempt had yet been made by the Corporation to introduce private lighting, but as they had every facility on the site of the present station for the accommodation and working of all the necessary plant for private lighting, and as the town was particularly well situated for the working up of a most lucrative electricity supply business, he had no doubt that before long they would be following the example set them by nearly all other leading municipalities, and wisely keep the valuable monopoly of supplying electricity to the citizens in their own hands by extending their present system and laying down suitable machinery.

Mr. James Perry, County Engineer of Galway, then read a paper on "Municipal Electricity." For six years, as part-owner and occupier, he said, he had been connected with the public and private supply of electricity in Galway. Electrical engineering was forced upon them, and they had got



House, Bar Harbor, Massachusetts.

to do their duty in regard to it as they had done their duty by the other human refinements which had preceded it. There had been for some years in the public mind a confusion between electricians and electrical engineers, which would be paralleled by supposing mariners and astronomers to be the same. Electricians were doing good work for engineers, but a mere electrician was not an engineer. Let them take two examples: the scientific gentleman who was mainly responsible for the "London supply" was a man of undoubted ability, and as an electrician his reputation had scarcely suffered by the failure of that venture. The financially most successful man was probably Edison, who was by training neither an engineer nor an electrician (he was reported to have sworn in court that he did not know Ohm's law), but who appeared to be endowed in a high degree with a combination of the qualities of common-sense and ingenuity which made him comparable to our own George Stephenson. Electricity leaving a central station, passing round an external current, and returning to the station, might be compared to an endless rope driven by a pulley in the station. If they conceived of a rope of that kind passing round capstans and through tight places of one kind and another, they would see that when it was made to circulate it would turn the capstans and heat the tight places. Let them call the speed of the rope amperes and the tightness of it volts. As many amperes returned to the central station as left it, but the volts varied from point to point. Now, if they multiplied the tightness or pull by the speed, they had the power

transmitted at any point. It was of no great consequence how the units, ampere, and volt had been fixed; the volt meant pressure or tightness of the rope; the ampere meant speed or quantity per second. There they were on familiar ground, because 746 watts were a horse-power. When 1,000 watts run for an hour it was called a Board of Trade unit. A unit of electricity, for which they in Galway charged 3*d.*, used in printing or bottle-washing, or 5*d.* used for lighting, was equal to $1\frac{1}{2}$ horse-power for one hour. When, however, they had to compare the value of a unit of electricity for lighting purposes with that of 1,000 ft. of gas, they had the elements of lamps and burners coming in in ways which allow of a considerable field for discussion between gas conservatives and electric radicals. It was fair at this time of day to accept Gordon's estimate, made long ago, that 1,000 ft. of gas was equal to ten units of electricity, which would make electricity at 3*d.* equal to gas at 25. 6*d.* With alternating currents electrical transformation was very simple; it was not so simple for continuous currents, and in this was a great point in favour of alternating currents for certain circumstances. There were disadvantages, and they had electricians who showed some partisanship both for continuous and alternating currents; the engineer would use what best suited his special conditions. Series dynamos were used for arc-lamp lighting, and compound dynamos for incandescent-lamp lighting, with accumulators. For five years he had every night run arc-lamps off a shunt dynamo, and he had



arged accumulators with both compound and unt dynamos. With a turbine at an inefficient ted he had also run incandescent lamps direct on a shunt dynamo without any injury, so that e above rules were in some respect flexible. ie electrical arrangements at a central station re absolutely simple. The part in which there s any complication was the accumulator rition. Accumulators, if used for storing, were first cost very expensive as compared with gas- lders, and if used as regulators they involved ne little complexity in connexions and switches. ith proper arrangements on the premises for aining defective plates, the maintenance of cumulators would give very little trouble. Accumulators were specially suitable for water- wing, because they allowed of the power being lised during the whole twenty-four hours. ere was a loss of energy in accumulators of ut 24 per cent.

Mr. T. de Courcy Meade (Manchester) proed a vote of thanks to the authors of the ers. He said the order of procedure with tric lighting in Londonderry had been the erse of that adopted with most of the English ns. In England the usual practice had been adopt electricity for private lighting and not to ertake public lighting. With regard to Mr. ry's paper, he did not think any ordinary nicipal engineer was likely to undertake an allation of electric lighting without the istance and advice of an electrical engineer. Mr. Pritchard, Birmingham, said it would be resting to know why Londonderry had gone or public lighting alone. With regard to the of electricity for tramways the accumulator em was financially a failure.

Mr. Lobley, Hanley, also thought that the t should be supplied to private consumers. In first six months' working at Hanley they had sufficient to meet all expenses, including rest on capital and sinking fund charges.

Mr. Broom, St. Helen's, said that a Borough ineer would be an extremely courageous man o would introduce an electric-lighting installa- by himself.

he vote of thanks having been accorded, Mr. Christie, in reply, said he thought it would e better for Londonderry to have worked the public and private lighting together on a ll scale, and extended them as it became essary.

Mr. Perry also acknowledged the vote of ks.

he Mayor entertained the members to luncheon he Town Hall. Subsequently a visit was paid uncanana, where the members were entertained inner at the Lough Swilly Hotel.

he meeting on Saturday was held in the

Town Hall, Portrush, when a paper was read on "Light Railways and Tramways," by Mr. R. H. Dorman, County Surveyor, Armagh.

HOUSE, BAR HARBOUR, MASSA-CHUSETTS.

THIS specimen of a house design by the well-known American architect, Mr. W. R. Emerson, is interesting on account of the octagon angle turret in the foreground, with its open story at the top, the treatment of which is both original and picturesque. It is well contrasted with the plain semi-circular bay at the further end of the façade.

UNITARIAN CHURCH, BAR HARBOUR, MASSACHUSETTS.

THIS is, as will be seen, an example of the modern "simple-picturesque" in American architectural design. The treatment of the little tower and cupola is agreeable and picturesque; whether the extreme rusticity of the stone piers is not over-acted may be a question. But the building is one to make an agreeable incident in a country landscape.

COMPETITIONS.

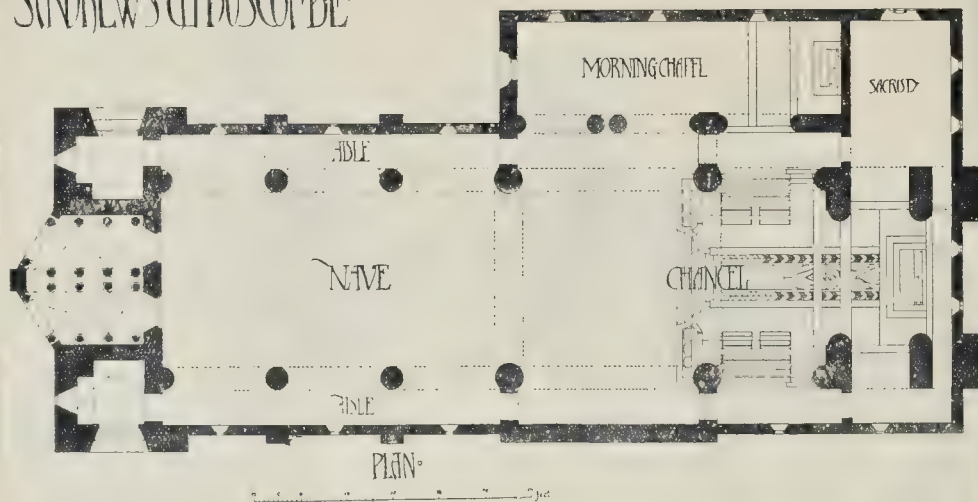
RECONSTRUCTION OF MUNICIPAL BUILDINGS, ABERDEEN.—The removal of the Watching Department, Burgh Court-room, &c., to the new premises, Lodge-walk, Aberdeen, will take place soon; and a statement showing extensive alterations proposed on the Municipal Buildings has been issued by the Town Council. Altogether, sixty-seven rooms, including public offices, are required. Local architects are invited to submit competitive designs for the reconstruction. A premium of 50*l*. will be given for the first design, and one of 20*l*. for the second. In the event of the Council proceeding with the work, the author of the first design will be employed as architect upon the usual terms of professional remuneration, and in such case the 50*l*. premium will not be paid. It may be mentioned that the local architects have found the memorandum issued to be unintelligible; and, besides, no provision has been made for widening Broad-street to the line of the new buildings at the University.

Y.M.C.A. BUILDINGS, NEWCASTLE.—A selection has just been made of the plans of the proposed new building for the Newcastle Young Men's Christian Association. Three sets of plans had been sent in for competition; and the committee, after consultation with Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, as assessor, have selected those submitted by Mr. J. W. Taylor, F.R.I.B.A., F.S.I., Westgate-road, Newcastle.

THE INSTITUTION OF JUNIOR ENGINEERS.

THE Belgian summer meeting of this Institution, which took place last week, passed off very successfully. Assembling at Harwich, crossed by the Great Eastern Railway s.s. *Ipswich*, and arrived at Antwerp on the 17th inst. Here they were welcomed by M. Roysers, Engineer-in-Chief to the Municipality, who conducted them over the extensive docks, and explained the numerous features of interest in connexion therewith. The Musée Plantin and the station of the Compagnie Hydro-Electrique Anversoise were also specially open for inspection. On Monday the members proceeded to Ghent, where MM. Carels' engine works, M. Van Houtte's nursery gardens, and M. de Heurplinne's cotton-spinning mills were seen, the respective proprietors showing the visitors round. In the evening Brussels was reached, and the central electric-light station there was visited under the guidance of Mr. Phibbs. Tuesday was left open so as to afford the opportunity of visiting the various places of popular interest for which the City of Brussels is noted; in the afternoon most of the party made an excursion to the field of Waterloo. Leaving Brussels on Wednesday morning, the members arrived at Liège about noon, and were received by M. Gillon, President of the Association of Engineers from the University of Liège, and by M. Firkets, President of the Liège Section. The afternoon was devoted to visits of the Vieille Montagne Zinc Works at Angleur, under the direction of M. Gillard, secretary of the company, and other gentlemen; and the St. Leonard Locomotive Works, where the chief engineer, M. Shoest, showed the members over. In the evening, at the Hôtel de Suède, a banquet was given in honour of the Institution by the Liège section of the Association of Engineers from the University, Mr. Gillon presiding, faced by M. Firkets. On Thursday, an excursion was made to Verviers, on the invitation of the Chamber of Commerce. Arriving at the Est Station, the President, M. Garot, M. Mullendorff, M. Soubre, Secretary, and other gentlemen of the town met the members, and entering carriages, the party drove to the wool-washing, combing, and dyeing works of MM. Peltzer et fils. The wool-card manufactory of M. Duesberg-Debez was next visited, after which the party were entertained at luncheon at the Société de l'Harmonie, M. Garot presiding. The wool-spinning, weaving, and finishing works of MM. Peltzer were seen afterwards, and train was then taken for visiting, under the guidance of the Engineer, M. Mahwood, the Gileppe Reservoir, which supplies water to Verviers and Liège. In the evening the Liège

ST. ANDREW'S CHURCH, BOSCOMBE.



Electric-lighting Station was seen, Mr. Hickson conducting the members through it. Friday's programme comprised a visit to the extensive works of the celebrated Société Cockerill, where the party were welcomed by M. Delloye Matthieu, Chairman, and M. Kroft, Chief Engineer to the Society. Luncheon was subsequently served, and in the afternoon the Val St. Lambert Glass Works were visited, with M. Deprez, General Manager, as guide. In the evening the summer dinner of the Institution was held in the Salle des Vitraux of the Hôtel Mohren, Liège, the Chairman, Mr. H. J. Young, presiding. On Saturday, sectional visits were paid to the Small Arms Works, the Liège Electric Tramway installation, the works of the Compagnie Internationale d'Electricité, the Liège Gas Works, and M. Foulon's Iron Foundry. The party returned to England in the afternoon. At each place visited throughout the week the Belgians were exceedingly cordial and generous in their welcome, evoking from their visitors expressions of the liveliest appreciation.

Illustrations.

INTERIOR OF PROPOSED CHURCH, ST. ANDREW'S, BOSCOMBE.

UP to the time of going to press we have not received from Mr. Wilson a description of his study for the west front of the proposed church of St. Andrew's, Boscombe, which formed one of the most prominent and striking exhibits in the Architectural Room of the last Royal Academy Exhibition. The exterior view, which was also exhibited, will be illustrated in a future number.

THE NATIONAL MONUMENT TO THE EMPEROR WILLIAM I., AT BERLIN.

The foundation-stone of this monument to the old German Emperor was laid with much ceremony on Sunday last, and the work is being proceeded with. We have before adverted to the unfortunate discussions in regard to this monument which have taken place at Berlin, and the high-handed manner in which the reigning Emperor has interfered to compel the nation, which is paying for the monument, to accept his ideas as to site and the design of the sculptor whom he specially favours.

The design is by no means generally approved of in Germany, but such as it is, it may be of interest to give an illustration of it. The principal illustration is from a photograph specially taken for us from a small model in the sculptor's studio, and afterwards touched up with body colour and chalk. It is not the most favourable method of illustrating a work of this kind, but it is the best at present procurable.

To recapitulate some of the main events in the history of the monument, we should first mention

that Emperor William I. died in March, 1888. A unanimous feeling almost immediately prevailed in the country that a great national monument should be erected as a memorial to a Sovereign who was so much revered, and that no expense on the part of the nation, or effort on the part of the artists, should be spared in the matter. In December, 1888, Parliament placed 5,000*l.* at the disposal of the Government for the purpose of obtaining a suitable design, with the object of facilitating the choice of a site for the memorial, as well as of obtaining some idea as to the kind of monument that would please the nation most. A preliminary competition for "an idea," as it was called, was opened in March, 1889. Of the 5,000*l.*, 1,600*l.* were offered in premiums. Artists throughout Germany welcomed the competition enthusiastically, and no pains were spared by those who entered. Where artists could not themselves raise the money for the expensive models, &c., many generous patrons were found to help them, and eventually 147 designs reached the assessors. The two first premiums were given to architects, whilst the four second awards fell to sculptors. One of the first premiums, awarded to Messrs. Rettig & Plann, was for the design of a Pantheon outside the town proper, and opposite the new Houses of Parliament on the Königsplatz; the second was won by Herr Bruno Schmitz for an elaborate architectural group, also outside the town. The majority of the designs showed heroic architectural groups for positions in the Tiergarten, of which the Königsplatz just mentioned is a part. Others showed designs for the Palaisplatz, just inside the Brandenburg Gate, whilst only a few indicated miniature architectural or sculptural schemes on the Opera Place, opposite the deceased Emperor's residence, or on the Schlossfreiheit, opposite the historical "Schloss," in which the present Emperor resides.

Public and expert opinion was much in favour of the assessors' award, and though a Pantheon would have required an enormous outlay, the money would at that time have been readily voted by Parliament, or even subscribed voluntarily. The present Emperor was, however, strongly opposed to the idea, and almost immediately had models for a miniature monument opposite his Schloss prepared by his Court Sculptor, Reinhold Begas, the well-known Court Architect, Mr. Ihne, also being consulted. Then followed the farce of a second limited competition among sculptors only for a monument, on the Schlossfreiheit site, which at the time still had a row of houses on it, and had to be cleared by a syndicate who were practically financed by the Emperor, who allowed them to open a lottery. After this came the unfortunate wrangles in Parliament as to the funds, and a general bitterness on the question in art circles, so that the public was soon thoroughly disgusted with the management of the affair. The Court Sculptor, Herr Begas, was finally commissioned by the Emperor to carry out the work, and, *protégé* of Herr Begas, Herr Gustav Hahnhuber,

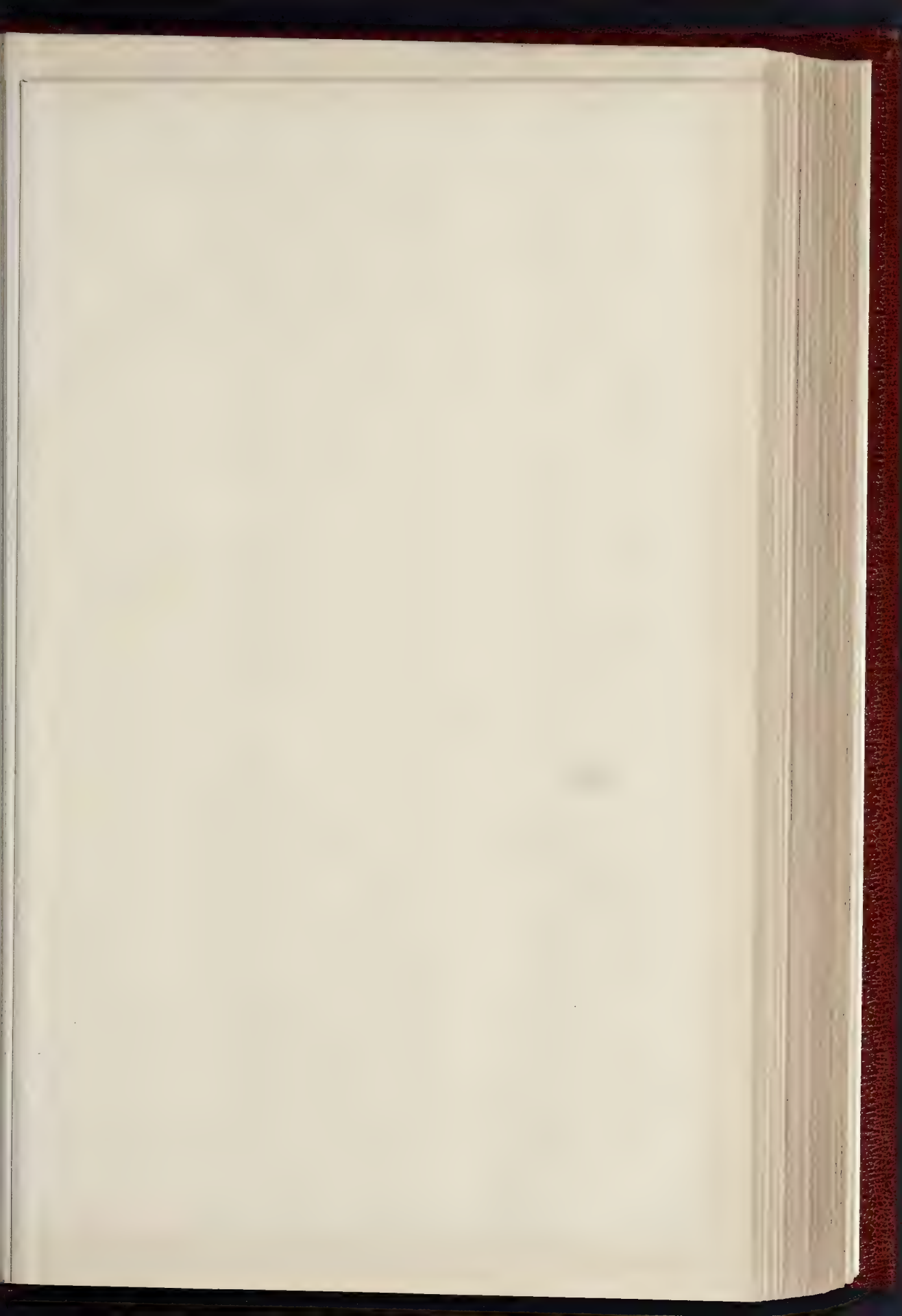
was entrusted with the architectural part, in lieu of Mr. Ihne.

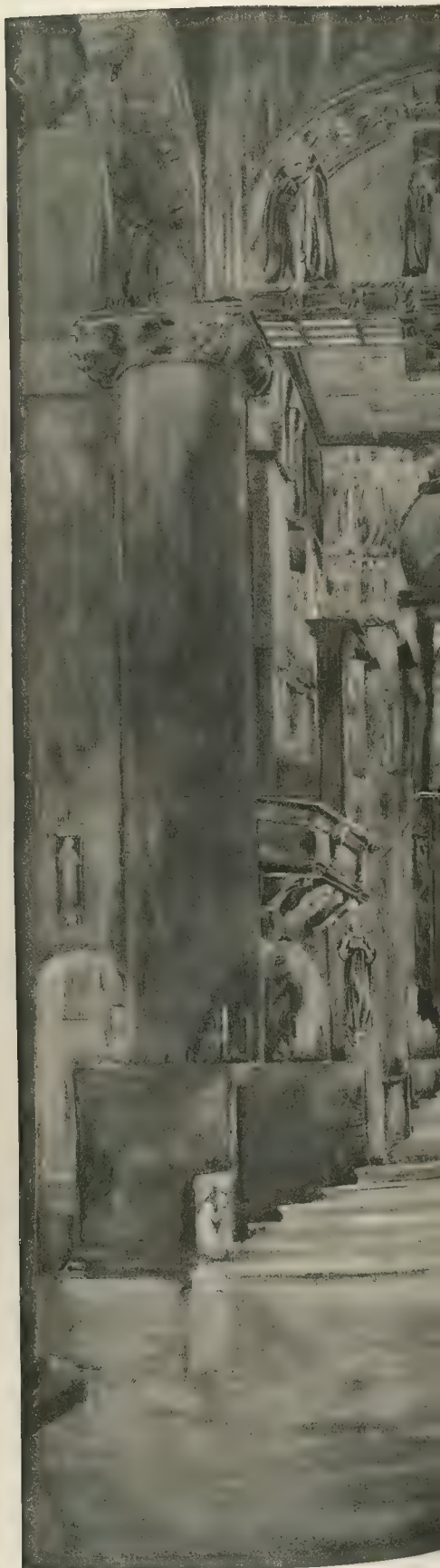
The monument as it is now to be carried out can no longer be termed a National Memorial. It may satisfy and please the Emperor, but the country has no interest in it, and satisfies its desire to honour the deceased by locally erecting numerous minor monuments. Some time back we suggested it was not too late to voluntary subscription. There is no reason why the equestrian statue should not simply stand as the local memorial, as in other German cities, whilst a Pantheon is erected as a tribute to the nation. This suggestion of ours has been much quoted by the Berlin Press, headed by our architectural contemporary, the *Deutsche Bauzeitung*. The most suitable site, as we said before, would be opposite the new Houses of Parliament, at present taken up by a nondescript theatre, known as Kroll's establishment, which is almost as much an eyesore as our Royal Aquarium at Westminster, and in a similar unfortunate position.

The position of Herr Begas' monument for the Schlossfreiheit is explained on the block plan accompanying the illustration. The monument faces the main entrance to the palace, which would dwarf anything standing within 500 ft. of it. The monument will practically be "killed" where it stands. There is no good view to be obtained of it except from the side and back, or from within the palace courtyard through the central *porte cochère*. The fact of two sides dipping into a narrow branch of the river Spree does not add to the dignity of its position, especially as the traffic on the river is of the barge description.

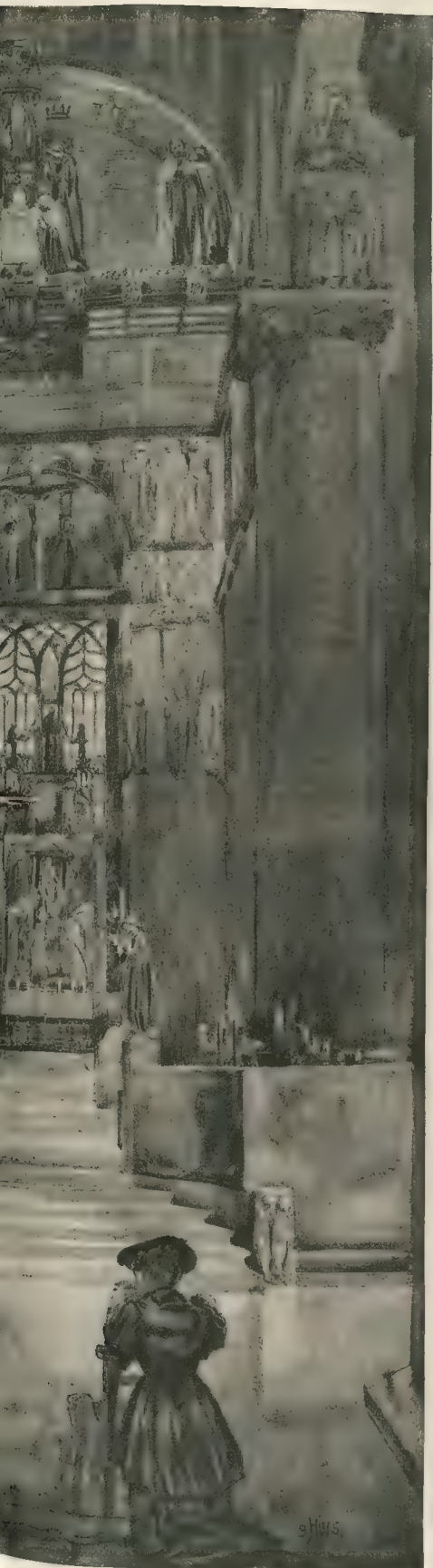
The statue itself shows the deceased Emperor on a charger which is led by an allegorical figure of "Victory." The pediment, which is decorated with symbolical reliefs, has four lions at either corner, whilst figures representing "Peace," and "War," take up positions at the foot of the pediment proper. The figures will be all in bronze, whilst the pediment will be of granite. The height of statue and pediment together is 22 metres, or 72 ft. The distance between the pediment and the castle opposite is 35 metres, or 115 ft. The entablature of the castle is about 28 metres, or 92 ft. above road level, whilst the cupola, which is just over the main entrance, opposite the monument is 65 metres, or 213 ft. high.

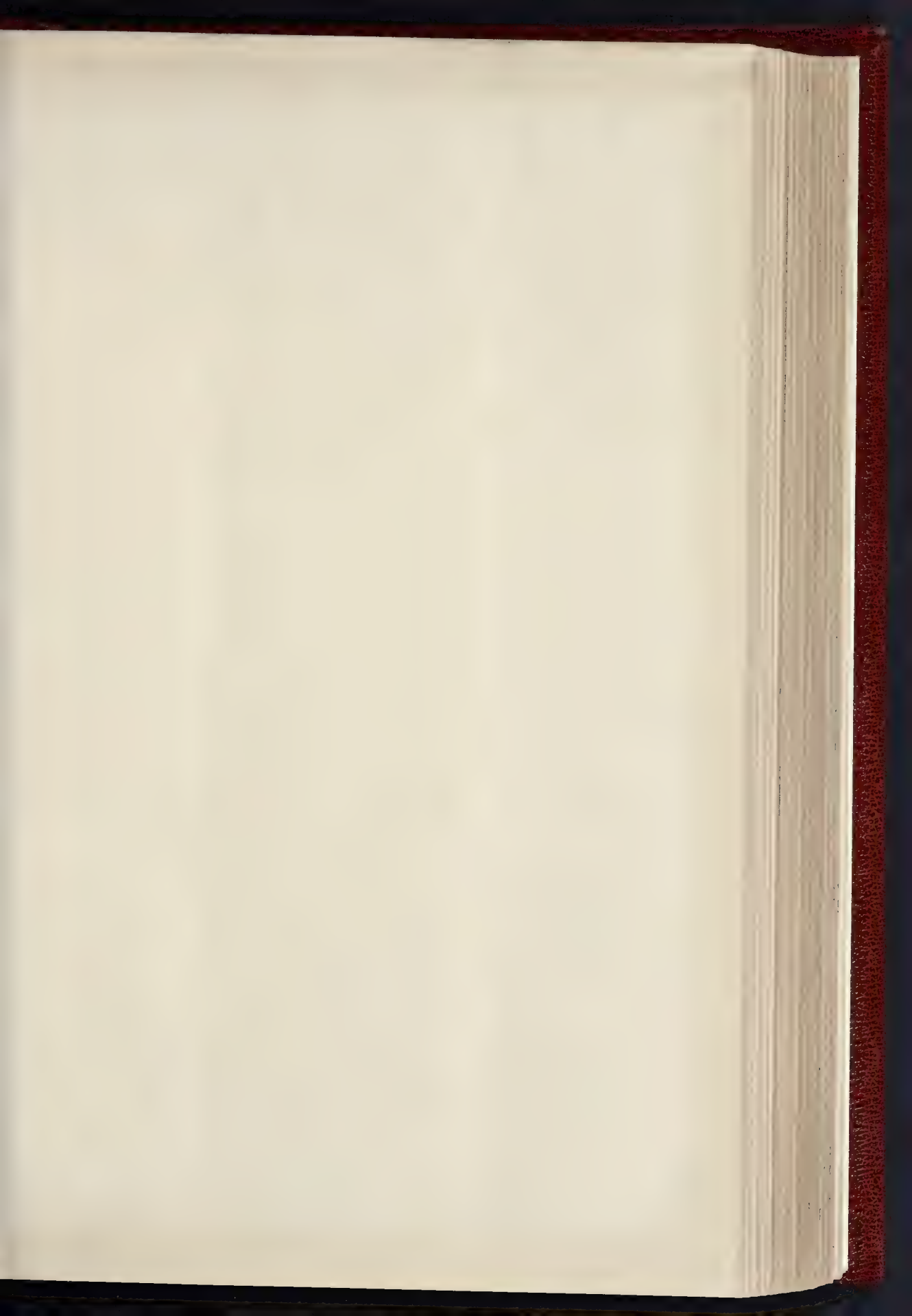
As to the colonnade, there is little to say except that good positions have been arranged for the statues, or busts, of contemporary statesmen and generals. There is much symbolical sculptural decoration, the two quadrigas indicating North and South Germany. The work will be of freestone on a granite base, picked out with bronze, and the busts and statues will be of bronze. The cost of the monument complete was originally estimated at £400,000, but Parliament having decided that not more than £200,000 is to be spent on the gratification of the Emperor's wish, we under-

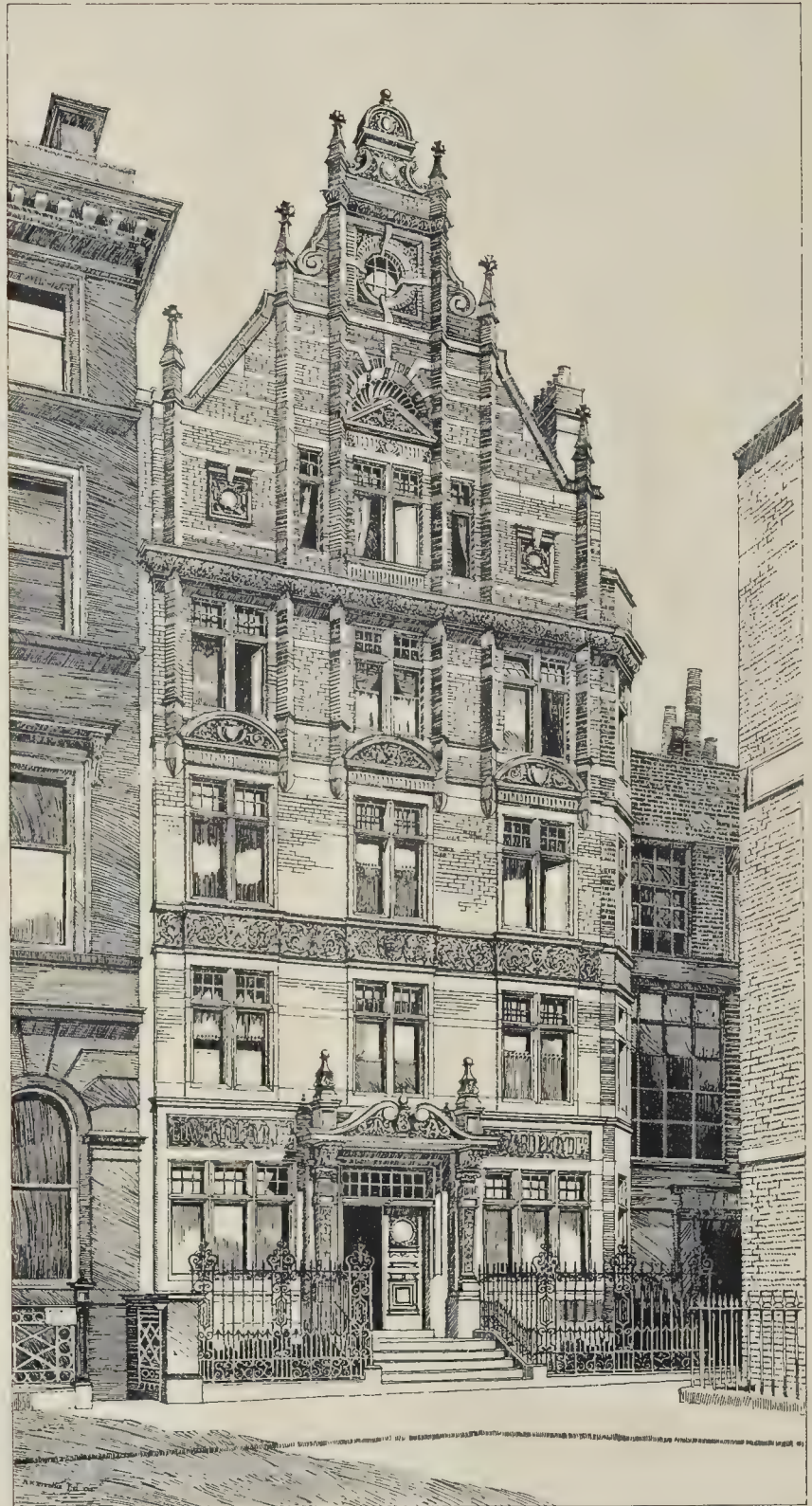




THE BUILDER



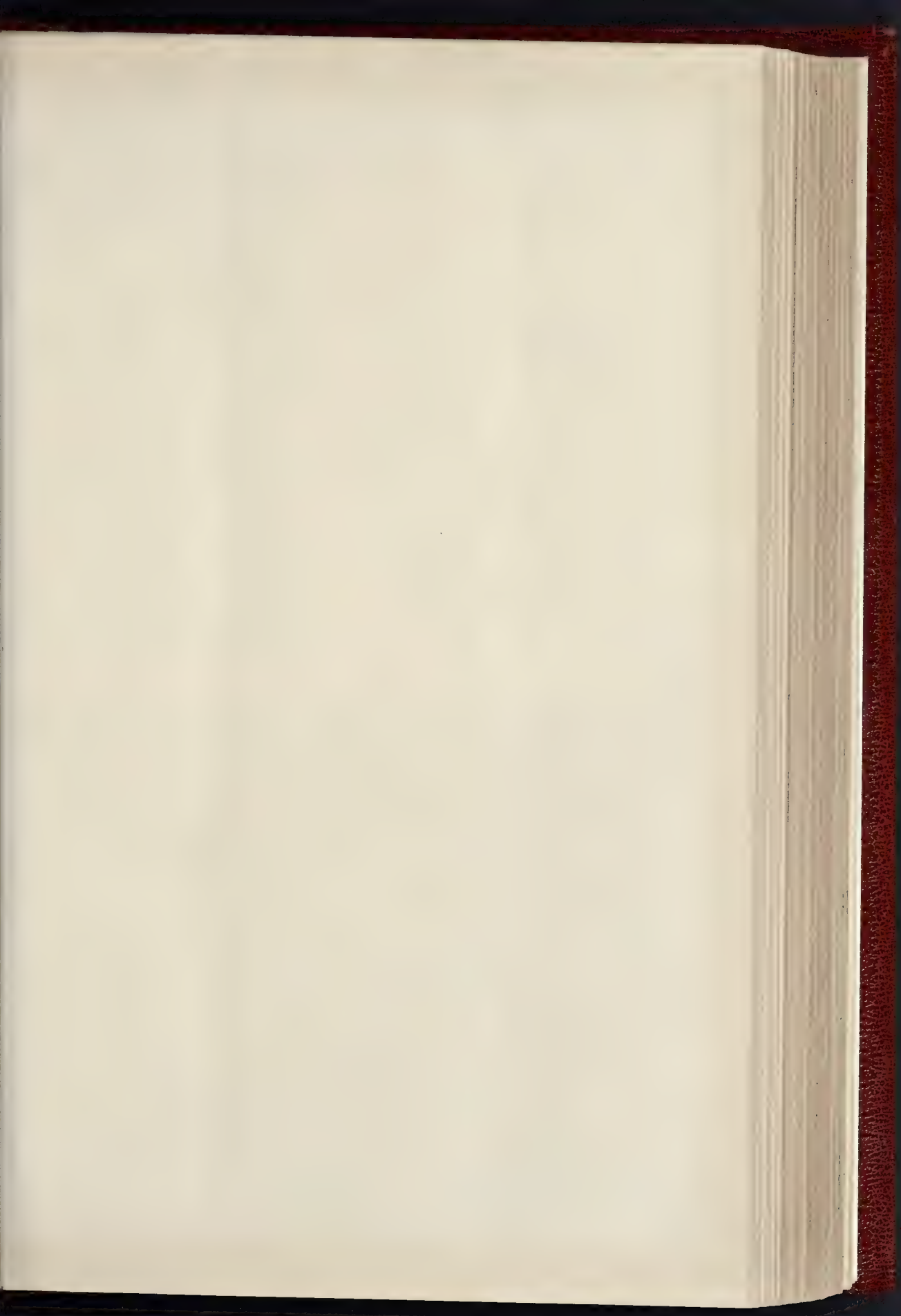


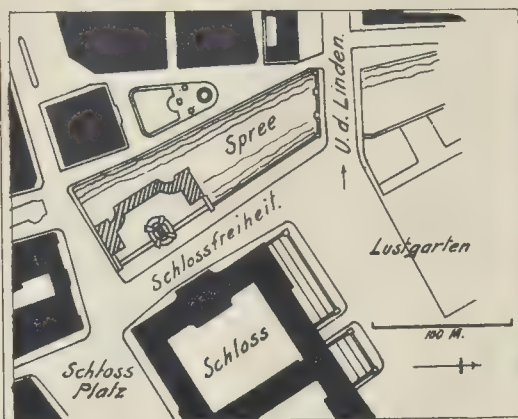


BUSINESS PREMISES SALISBURY SQUARE, E.C., FOR MESSRS. EDWARD LLOYD, LTD
MR. H. L. FLORENCE, F.R.I.B.A., ARCHITECT



ASHTON GRAMMAR SCHOOL
DUNSTABLE
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ARCHITECT
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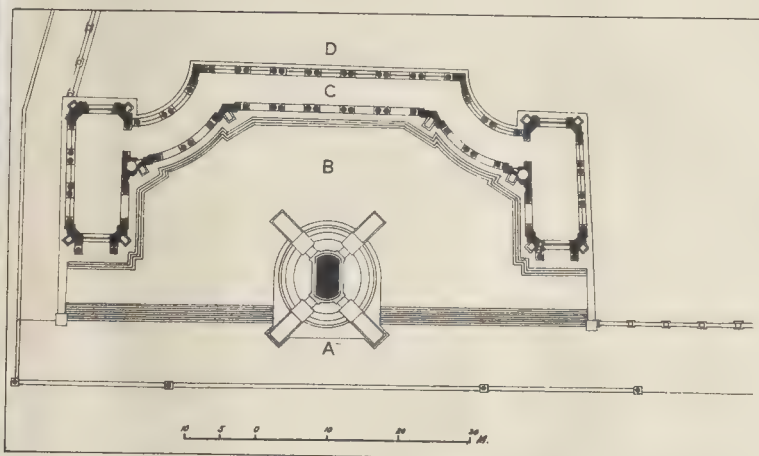


PLAN OF SITE.



NATIONAL MONUMENT TO EMPEROR WILLIAM I, BE

- A. Equestrian Statue
- B. Terrace
- C. Colonnade
- D. River Spree.



PLAN OF MONUMENT.



MONUMENT TO THE VETERANS OF THE AMERICAN CIVIL WAR, 1861-1865, LAST HARBOR, STREET BETTER LANE, E.C.

nd much of the sculptural decoration on the ade will have to be omitted, or its com- pletion at least postponed, until the country's presentatives are more ready to spend the extra pounds on a design which is not to their mind. Herr Reinhold Begas has already done much od work lately in the new Houses of Parlia- ment. His chief assistants are Messrs. Bernewitz Hidding, Herr Halmhuber, the architect, who is responsible for the colonnade and architectural tail of the pediment, is a former assistant of Messrs. Wallot, and has been successful in several competitions.

EW OFFICES FOR MESSRS. EDWARD LLOYD, LIMITED, 13, SALISBURY SQUARE.

REQUIRING more accommodation than was obtainable in the already extensive range of ildings, which reaches from Salisbury-square to eet-street and from Salisbury-court to White- ar-street, for the production and printing of *Lloyd's Weekly News* and the *Daily Chronicle*, d for the rapidly-increasing business of the dingbourne Paper Mills, Messrs. Edward oyd have recently incorporated the two houses ich formerly separated them from the Church issionary Society's building in Salisbury-square. he rebuilding of these premises, of which a spective view is given this week, now pro- es on the ground floor for the advertising ces of *Lloyd's News*, and on the floors above e the London offices of the Sittingbourne Paper lls and the board-room of the company; while, he basement, is placed the additional machi- ry now found necessary.

The elevation to Salisbury-square, which is own in the drawing, is built in T.L.B. red cks with dressings and bands of red Mansfield ne from the Lindley Quarries. The ornamental nize tablets over the ground floor windows re supplied by the Coalbrookdale Company, d the boundary railings by Messrs. Longden & . The windows throughout are fitted with essrs. Burt & Potts' casements.

The floors of the building are fire-proof, the rk of Messrs. Willis & Astley; and the orna- ntial ceilings are of fibrous plaster, made by J. M. Boekbinder. The staircase, which s to the third floor, is of oak, with teak treads, d has a wall dado of Whitefriars glass tiles, plied by Messrs. Powell & Co. The internal res are also of oak, and with the staircase, re carried out by Messrs. R. E. Worsley & Co., oak mantels being made by Mr. Charles ndley. The mosaic flooring and the wall ng were executed by Messrs. W. B. Simpson Sons, and the electric-light fittings were plied by Messrs. Faraday & Son.

The work of rebuilding was carried out by essrs. Edward Lloyd themselves, without the e of a general contractor, from the designs and ler the personal superintendence of the archi- ts, Messrs. Henry L. Florence & Herbert A. chell, of Gray's Inn, while Mr. R. Trice acted clerk of the works.

ASHTON GRAMMAR SCHOOL, DUNSTABLE.

HE new grammar-school at Dunstable, the stance of which arose out of a bequest by Mrs. nton, has been so far completed that the hall ards the road has now been added as given in llustration.

The building, owing to financial reasons (and delay caused by the Charity Commission), been built piecemeal, and still lacks various ews now always present in such buildings, of which it is to be hoped will ultimately be ed.

he building has been erected from the designs Mr. E. R. Robson, F.S.A., architect, and t by Mr. Samuel Jerrard, of Lewisham, who d immediately after the completion of the hall, e situation of Dunstable is very high and ping, and under the headship of Mr. L. C. R. ing the school is already quite full of boys. n exterior view of the school was given in the lder of July 21, 1894.

HAPEL, CONVENT OF THE CROSS, BOSCOMBE, RENEWED.—The Bishop of Portsmouth, the Dr. John Virtue, has just laid the founda- stone of a new Catholic Church, to be ed in the rear of the Convent of the Cross, wood-road, Boscombe. The new church is ed to seat 400 worshippers, and has been ed by Mr. J. W. Lunn, of Great Malvern, contractors being Messrs. Jenkins & Sons, of smouth.

Correspondence.

To the Editor of THE BUILDER.

SWANSEA BOARD SCHOOL COM- PETITION.

SIR,—I am very glad to see that you have called attention to the conditions of the above.

The last proposal of the Swansea School Board was even less liberal, as the 4 per cent. offered had also to cover the cost of the preparation of quantities.

A London architect was placed first in the latter case by Mr. Robson, who acted as assessor, and after a great deal of wrangling, the School Board appointed him as architect. I hear that there have been considerably over 100 applications for conditions in the present case, so that, probably, members of the School Board will be confirmed in their belief that they are acting in a fair and generous manner.

I have in vain attempted to get the local architects to take unanimous action in this and similar cases, but with no effect, and it only remains for me to abstain from such local competitions as this, which contain conditions showing a wish to ignore the customs of the profession.

I hope that some of your readers who may have been inclined to compete in this instance will think the matter carefully over, when I think they will be inclined, in the common interest of the profession, to let this and competitions of a like nature alone.

Swansea.

H. W. WILLS.

DURHAM MUNICIPAL BUILDINGS COMPETITION.

SIR,—We should like to draw the attention of the other competitors in this latest bit of competition jobbery to the following fact, which seems to have escaped their notice.

Messrs. Barnes & Coates were *not* placed second by the assessor. This we have on unquestionable authority. As a consequence, some hard-working competitor has been swindled out of his well-earned second premium.

We shall be glad if you will kindly give this letter space. Surely it is about time architects combined to put a stop to this shameless jobbery.

TREADWELL & MARTIN.

The Student's Column.

METALS USED IN BUILDING.—IX.

MERCURY.

NATIVE mercury, or quicksilver, occurs but sparingly in the few localities in the world which yield the bulk of mercury ores. On breaking open samples of the latter, however, minute globules are occasionally seen, and as an extremely rare occurrence the native metal is found in cavities in such large quantity as to be taken out in buckets. By far the most important ore is *Cinnabar*, or sulphide of mercury, having about 86½ per cent of the metal. This ore has been mined since very ancient times, it is the "minium" of old writers, and is identical with the "vermillion," when that name is correctly employed. Its use as a pigment was known long before the Christian era; according to Muspratt, Theophrastus (300 B.C.), described the process of the manufacture of vermillion in the dry way. It has also been known to the Chinese, like many other things, for centuries. M. Berthelot remarks "that the ancients were aware of many of the properties of amalgams, and practised fire-gilding."

At the present day the manufacture of vermillion and the amalgamation of silver ores are the chief uses of quicksilver; but it is also extensively employed in fire gilding, for mirror backs, meteorological instruments, &c. On the whole, it cannot be said to be a metal of varied usefulness, although in some respects it is the most remarkable of substances. The elaborate researches of Mr. Geo. F. Becker⁺ show that these ores have been formed principally along the lines of most profound geological disturbance, i.e. in connexion with the elevation of great mountain ranges. The largest mines are at Almaden, in Spain; Idria, in southern Austria; Huancavelica, in Peru; and in the province of Kwei-chau, in China. Others are situated in the mountainous regions of northern Italy; in parts of Australia, Ekaterinoslav, Russia; in parts of Australia, Argentina, the Transvaal, &c.

Cinnabar is closely associated with eruptive

⁺ "Introduction à l'Étude de la Chimie Ancienne," 1890, p. 40.

⁺ "Geology of the Quicksilver Deposits of the Pacific Slope, 1898," also in "Mineral Resources of the U.S., 1892," pp. 139-162.

phenomena, and is, therefore, generally found in igneous rocks, or can be shown to have emanated from these latter. In the neighbourhood of Almaden, diabase (a granitic-looking rock) is found carrying thin "stringers" and pockets of the ore. At Idria there is a tuft related to rhyolite (a volcanic rock); and in Italy, near Monte Amiata, cinnabar is found in lavas, and the famous Vallalta deposit is at the contact between an igneous dyke and Triassic rocks. There are also a considerable number of cases in which the ore is immediately or closely associated with hot springs. In America it is now being deposited from the highly-heated waters of Sulphur Bank, California, and at Steamboat Springs, Nevada. In Europe quicksilver, or its ores, are reported from the fumaroles at Pozzuoli, near Naples, from hot springs in the Puy de Dôme, France, and other places. The recent discovery of the metal at Spring Creek, Bingara, New South Wales, is important as making another valuable contribution to the already vast mineral wealth of that colony. As an illustration of the mode of occurrence of mercury ore we append the following (fig. 7), based on the report of Professor

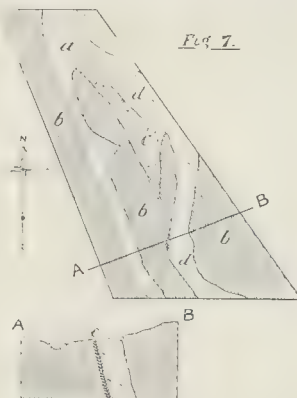


FIG. 7.—Map and section showing the occurrence of Mercury near Bingara, New South Wales.

a=Alluvial clays and gravels containing waterworn cinnabar. b=Claystone. c=Limestone. d=Intrusive serpentine. e=Serpentine intermixed with claystone and containing cinnabar.

T. W. E. David.* From this we observe that the mercury is found in two ways in the district, viz., in lodes and in alluvial (superficial) deposits. No doubt the ore in the latter was derived from the denudation of the rock enclosing the lode. The dyke in which the metal is found is described as a "decomposed serpentinous rock with interstratified layers of soft purple clay shale." It yields no evidence of the existence in it of any true fissures. The cinnabar is disseminated chiefly throughout the mass of the dyke in small spots "from the size of a small pin's head up to that of a pistol bullet." The productive part of the intrusive rock is about 3 ft. 6 in. in width.

In other localities, quicksilver deposits occur as fissure veins, irregular bodies, impregnations, and "placers." The greatest of all deposits, that at Almaden, contains two large well-developed veins, in part conformable with the surrounding strata and in part cutting them. Many of the smaller Californian deposits are simple veins.

At ordinary temperatures mercury is liquid; when cooled to -40 deg. C. it solidifies, and is then soft and malleable; heated to 350 deg. C. it boils and volatilises as a heavy colourless vapour. When pure it does not tarnish, and dissolves readily in nitric acid. At ordinary temperatures, also, it forms an amalgam with lead, or zinc, but in order that it shall amalgamate with other metals, mercury must be heated.

SODIUM.

Only two of the numerous sodium compounds are interesting to us, viz., *chloride of sodium* (common salt) and *carbonate of soda* (common soda). Seeing, however, that the latter is for the most part artificially prepared from the former, the chloride is the only one of real use in a commercial sense. The applications both of salt and soda are far too numerous to be given specifically, but with reference to salt it may be remarked

* "Annual Report," Department of Mines and Agriculture N.S.W. 1894, p. 237.

that when heated to redness with silica it forms a readily fusible silicate, a circumstance taken advantage of by the potter and brickmaker. It is extensively employed as a glaze on stone-ware and similar goods, though unless judiciously applied, is apt to do the work very ineffectively, so much so that "salt glazes" are not always regarded in a favourable light. Salt forms fusible compounds with antimony and arsenic, and is thus in great request by the metallurgist. Soda, or sodium carbonate, possesses the property, amongst other things, of oxidising many metals, such as tin, zinc, iron, &c.; it forms fusible compounds with silica and several metallic oxides. Both soda and salt are much used in glass-making. *Glauber's salt*, or mirabilite, may perhaps be mentioned here; its principal employment for us is in connexion with testing the durability of building stones, as in Brard's method, though that has more interest from the historical point of view than as a method extensively adopted at the present time. It is hydrous sulphate of soda; when exposed to the air it becomes anhydrous and falls to powder; commonly, also, it occurs as a white or yellowish efflorescence.

With reference to the metal sodium, it is soft, silver-coloured, and possesses a strong affinity for oxygen. It was discovered by Sir H. Davy, by exposing a piece of moistened hydrate of soda to the action of a powerful voltaic battery, the alkali being placed between a pair of platinum plates connected with the battery. Sodium is so soft at ordinary temperatures that it may be easily cut with a knife or pressed between the finger and thumb. When placed upon the surface of cold water it decomposes that fluid with violence, but does not ignite the hydrogen which is liberated unless the motion of the sodium be restrained, when the cooling effect is much less. When a few drops of water are added to sodium the hydrogen liberated immediately flares up, and such is also the case if it be put on hot water. It burns with a yellow flame. The last-mentioned properties have received a striking illustration during the past year in connexion with explosions in street boxes, as recently reported on by experts engaged by the Board of Trade.

Common salt is derived from two principal sources: (1) the sea, from which it is obtained by evaporation, and (2) rock-salt which occurs in stratified deposits in various parts of the world. In Great Britain enormous quantities are raised; most of it is produced from brine, especially in Cheshire, and also in Durham, Lancashire, Staffordshire, Worcestershire, and Yorkshire. Rock-salt is worked in the first-mentioned county and in Antrim, but the quantity so obtained is only one-tenth of the total output. In some cases the brine flows through pipes to the alkali works, and is converted directly into soda. From the manner in which rock-salt occurs in this country it is tolerably certain that it was laid down in inland seas or salt lakes, somewhat like the deposits now taking place in the Great Salt Lake, Utah, the Caspian Sea, and elsewhere. It is found in rocks of early Secondary age (chiefly the Trias). The following section (fig. 8) refers to a boring in the Durham salt district at Middlesbrough, where, it will be noticed, the salt-rock is 100 ft. in thickness, and is situated 1,266 ft. from the surface of the ground. Salt is a mineral of almost world-wide distribution.

POTASSIUM.

This possesses but little interest for us. Like sodium, it is a soft metal resembling silver in appearance, and eagerly absorbs oxygen on exposure to the air; when placed in water it likewise burns fiercely. Its principal ore is *carminite*, a massive and granular mineral which is strongly phosphorescent. Chemically, it is hydrous chloride of potassium and magnesium, with about 26 per cent. of chloride of potassium. It is found in large quantities at Stassfurt in Saxony, associated with rock-salt. *Nitre*, saltpetre, or nitrate of potash, is another ore of almost world-wide distribution; it is used in the manufacture of gunpowder, being such a powerful oxidiser it is in great request by metallurgists. In addition to being obtained from ores, potash is derived from the ashes of trees and land plants in general, where large forests occur, as in the United States, Canada, Russia, Sweden, Germany, Tuscany, and France. The process of extraction consists, briefly, in incineration, the resulting ashes being chiefly carbonates, chlorides, sulphates, phosphates, and silicates of potassium, sodium, calcium, magnesium, and iron; carbonates generally constitute by far the larger proportion of the ash, which is treated with water to dissolve out the soluble constituents. *Potassium*

carbonate, derived also from the rock at Stassfurt and from sea-water in enormous quantities, is used in the manufacture of crystal glass. *Potassium nitrate* is also employed in making glass; this salt occurs, together with other nitrates, as an efflorescence on the soil in various hot countries. In India it is regularly and systematically collected,

Fig. 8.

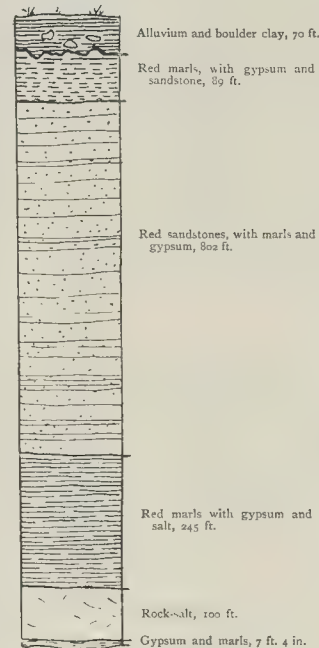


FIG. 8.—Section of Boring, Durham Salt District, at Middlesbrough.

and after approximate purification is exported in large quantity. *Yellow prussiate of potash* is used in making Berlin blue.

AMMONIUM.

The existence of this metal has not yet been fully demonstrated, though from the characteristic behaviour of its compounds there is little doubt but that it should be regarded also in a separate category by inference. All the ammoniacal salts are more or less soluble, and are easily and completely volatilised before the blowpipe, which latter circumstance alone is sufficient to distinguish them from other salts. The compound in which we are principally interested is the chloride, or *sal-ammoniac*, a mineral generally existing as an efflorescence or incrustation, though it occurs also in the crystalline form. It is found commonly in volcanic districts, as at Etna, Vesuvius, Stromboli, and Hecla; also in the neighbourhood of ignited beds of coal, and in sea, and certain mineral waters. In this country it has been discovered at Newcastle-on-Tyne, near Paisley, and Bradley in Staffordshire. Mr. Rutley states that it is prepared artificially from bones and other organic matter, also from the liquor condensed from gas-works and from soot. *Sal-ammoniac* is used in various metallurgical operations. Copper is tinned by the aid of this substance; * this is accomplished by the copper surface having first been made smooth by rubbing it with sandstone, after which it is made hot and powdered *sal-ammoniac* is applied. This latter has the property of removing the oxide from the surface and leaving the copper perfectly bright. A little tin is now placed upon the copper together with some powdered rosin. The plate is again heated, and when the tin melts it is spread over the surface to which it firmly adheres. The tin employed for this purpose is sometimes alloyed with lead. *Sal-ammoniac* is also extensively used in soldering.

* Consult Bloxam & Huntington, "Metals," 1894, p. 268.

OBITUARY.

MR. JOHN COLSON.—We regret to announce the death of Mr. John Colson, F.R.I.B.A., senior member of the firm of John Colson & Sons, architects, of Winchester, which took place at his residence, Berby-road, on the 28th inst., in his seventy-sixth year. Mr. Colson, although not a native of Winchester, lived the greater part of his life in the city. The son of Mr. John Colson, of Hall Court, Sheffield, he served his articles with the late Mr. Owen Carter, of Winchester, and had as his fellow pupil the late George Edmund Street, R.A. He afterwards proceeded to London, and subsequently he entered into a partnership at Norwich, which did not prove a success. Returning to Winchester, he started in business on his own account, since which he has carried out many works, for the most part of an ecclesiastical nature, including the building or restoration of over 120 churches, among them new churches at Awbridge, Herriard, Fair Oaks, Morestead, Ovington, Portsdown, Ramsdale, Sholing, Shaliden, Stockbridge, Swanmore, Soberton, Bradley, Sheffield, Lockerley, St. Paul's (Wyke), and Hedge End, and extensive alterations and additions at Highfield (Southampton), Micheldever, &c. Amongst other works carried out by the deceased were the Diocesan Training College, Bishop Morley's College, and additions at Hoddington House for the late Lord Basing, besides many schools. He was appointed architect to the Dean and Chapter in 1855, and among the more important works carried out by him upon the Cathedral fabric were the restoration of the west front over thirty years ago, and of the roof of the south transept. He was in 1858 elected a Fellow of the Royal Institute of British Architects. He served on the Winchester Town Council for a short period. Mr. Colson was of a quiet, retiring, yet genial disposition, taking little part in public affairs, his leisure during the late years of his life being spent in scientific and horticultural pursuits. The deceased leaves a family of two sons and three daughters. Mr. John B. Colson, who has been associated for some years with his father, will, we understand, carry on the business. The funeral took place at Shedfield, on Saturday last. The following interesting particulars we take from the letter of a gentleman who knew Mr. Colson well:—"He was working at the office only a few hours before his death, in the room where, accumulating curious furniture and beautiful pictures, he had worked for years. He was active and lithe to the last, and three years ago when walking on the east end roof of the cathedral he amused me by imitating the gait of a former bishop who would not be assured that one can't slip on lead. Apropos of his Norwich partnership he told me (in sympathy here) that it had brought him a brass inkstand for a thousand pounds. Mr. Colson was a man of genius, in everything inventive and masterly, very definite in his likes and dislikes, full of kindness and wit, and always ready for a joke, but some people never found this out, and to them he was cold and distant. He had a grand head and fine features, and a tall upright figure. One of his pupils was J. K. Colling, whose beautiful details of 'Gothic Ornament' he used to give his later pupils to work on. He was a great admirer of Ruskin, and once wrote a book ('The Elements of Drawing') to me, remarking that 'he always had to go right through in reading him.' From the moment of meeting, when he was kind and encouraging, and all through the time after and to come, I had, have, and shall have the deepest affection and gratitude for his kind and sympathetic teaching and friendship."

GENERAL BUILDING NEWS.

INFIRMARY, KING'S NORTON, WARWICK.—The foundation-stone of a new infirmary for the King's Norton Union was laid on the 21st inst. The building when complete will contain an administrative block in the centre, with medical officers', matron's, store-rooms, &c. This block is large enough to enable the officials to deal with an additional 250 patients, which, with the present provision will give accommodation for 500. On either side of the block will run corridors, to which will be connected with the nurses' rooms, bath-rooms, &c., with lavatories at the end, connected with short lobbies. Emergency staircases will be provided in each ward, and hydrants will be placed in all wards in case of fire. The wards are so arranged that the air has free circulation, and they are so situated that they receive the full benefit of the sun, both from the east and the west. At the rear of the administrative block will be the cooking kitchens, nurses' and servants' living-rooms, culinary stores, wash-houses, &c., and also will be situated all the waste in case of fire. The wards are so arranged that the air has free circulation, and they are so situated that they receive the full benefit of the sun, both from the east and the west. At the rear of the administrative block will be the cooking kitchens, nurses' and servants' living-rooms, culinary stores, wash-houses, &c., and also will be situated all the waste in case of fire. The wards are so arranged that the air has free circulation, and they are so situated that they receive the full benefit of the sun, both from the east and the west. At the rear of the administrative block will be the cooking kitchens, nurses' and servants' living-rooms, culinary stores, wash-houses, &c., and also will be situated all the waste in case of fire. 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be old "midden." In construction and design baths are almost a replica of those recently provided by the Corporation in Kirkstall-road, the object being the same—Mr. Hanstock, of Batley, interior fittings are practically identical. The area in the first-class bath is 60 ft. by 24 ft., in the second-class bath 75 ft. by 30 ft. There is the first-class room marble-lined dressings on one side of the bath, and in the second-class the open boxes, slate-lined, all round, forming end of arcade, which supports a gallery, for the convenience of spectators. Mr. Ainsley was clerk of the works.

EPISCOPAL CHURCH, INSCH (N.B.).—St. Aidan's Church, Inch, was consecrated, on the 21st inst. The church was designed and carried out by Messrs. Ross & M'Beth, architects, Inverness, CHOO, LANCASTER.—The first school erected by the Lancaster School Board was opened by the Mayor (the Mayor) on the 17th inst. This comprises the infants' portion only for upwards of 300 children. The entire school, when completed, will accommodate for 1,000 children. The school has been built by local contractors from the designs under the superintendence of Mr. Robert Walker, architect, Windermere, and Church-street, Lancaster, whose plans were selected in public competition.

CATHOLIC CHURCH, HULL.—The foundation-stone of St. Wilfrid's Catholic Church, which is being erected on the Boulevard, Hesse-road, Hull, will be laid to-day (Saturday). It will consist of nave, 76 ft. long by 22 ft. wide, a north and south aisles, 10 ft. 6 in. wide. At the end of each aisle is an octagonal ended side chapel, 22 ft. long by 12 ft. 6 in. wide, the roof of which will be groined. One chapel is to be dedicated to the Blessed Virgin and the other to the Sacred Heart. The aisles will be lighted by ten three-light clerestory windows, the clerestory of the nave by the same number, but rather less in size. The sanctuary has four two-light traceried windows, whilst the floor over the sacristy will be groined in such a manner as will suit colour decoration in the future. The nave is divided on either side from the aisles by a series of five bays, with moulded archer resting clusters of polished red granite shafts, with fluted bases and carved capitals. The choir is at the west end, above the main entrance, with an organ-chamber and belfry at the west. There is a large working sacristy, with vault below, from which it is proposed to connect the church with the high-pressure steam. The accommodation provides for about 1,000 adults, and the contract for the building has been let to Messrs. Colley & Levitt for the sum of £8,054. The church has been designed by and is being carried out under the superintendence of Messrs. Smith, Brodric, & Lowther, architects, of

FLATS, DUBLIN.—There is now being erected in Marlborough-terrace, Dublin, a large pile of buildings, each designed for residences in flats. The building has six stories and a basement. It has a height of 74 ft., with a depth of 70 ft. The height to gables is 100 ft. The different flats may be reached through a grand staircase or by means of lifts. The floors are of fire-proof material. The hall-door entrance to a hall which is provided with a lift may be reached. Each flat is divided with a kitchen with coal "cellar," &c., and a shoot for carrying off the dust at the back. At the back of the building is a servants' closet and the servants' rooms. There is a large area in the centre of the building open to the sky, the walls being lined with the white enamel tiles. At the front is a drawing-room and dining-rooms with sliding doors by means of which the three apartments may be combined in one for at-homes, dances, or other parties. There are bath-rooms, both hot and cold, on every flat. The building is being executed under the designs of Mr. Hudson, C.E., of Dublin, the work is carried out under the directions of Mr. Fitzpatrick.

CHURCH, ILKESTON.—The foundation-stone of a new church at Ilkeston was laid recently. The building, when completed, is intended to replace the temporary church at Hallam Fields, erected by the Ilkeston Ironworks Company. The same company is building the permanent church immediately to the west of the present one. Mr. Percy Curry, of Ilkeston, is the architect, and the church will be a red brick structure, with stone dressings, capable of seating 450 people. It is designed in the Decorated style. The contractor is Mr. W. V. Ireson, of Ilkeston.

CATHOLIC CHURCH, FERBANE, IRELAND.—A new Catholic church is being erected at Ferbane, in the parish of Mr. William Hague, architect, Dublin. The church will consist of nave, transept, chancel, and will be 110 ft. long from the main entrance to the great chancel window, 31 ft. wide at nave, 16 ft. at the chancel, and 22 ft. at the transepts. It will contain two sacristies, a belfry tower at the western front 100 ft. high. The nave will contain five tracery windows on each side, and the transept two windows, there will be a chancel window 20 ft. high and 12 ft. wide. The belfry will be furnished with a spiral stair as far as the organ-loft. The chancel is a nave tracery side-light windows. The elevation of the roof will be 24 ft. from wall plate. Mr. Glennon, of Dublin, is the clerk of works.

MEMORIAL HALL, UPPER HEELEY, YORKSHIRE.—On the 26th inst. the memorial-stone of a new building, to be called the "Henry Adams Memorial Hall," was laid at Upper Heeley. Mr. W. J. Taylor is the architect. The new building will contain a hall capable of accommodating 250 people, and there will be four class-rooms.

POLICE-STATION, SOUTH MOLTON, DEVONSHIRE.—A new police-station has just been erected at South Molton. The building has a frontage of about 60 ft., and is three stories high. Messrs. Stevens & Son, of Exeter, are the contractors, the cost being about a 3,000. Messrs. Garton & King, also of Exeter, supplied the hot-water apparatus for the cells. Mr. E. H. Harbottle is the architect, and Mr. Bevis clerk of the works.

PROPOSED ISOLATION HOSPITAL, HINCKLEY, LEICESTER.—On the 23rd inst., Dr. R. Deane Sweeting, Local Government Board Inspector, conducted an inquiry at the Town Hall, Hinckley, into an application for a loan of £4,000, for the purchase of land and erection of permanent buildings to be used as an infectious hospital by the Hinckley Urban and Rural District Councils. Messrs. Simpson & Harvey, of Leicester, are the architects.

NEW CONVALESCENT HOME, GRANGE-OVER-SANDS.—Tenders for this work were opened at a meeting of the Executive Committee of the North-Eastern Counties' Friendly Societies, previous to a meeting of the General Committee of that body, in the Oddfellows' Hall, West Hartlepool, on the 24th inst. The latter resolved to adjourn the consideration of the work for the new home to that day five weeks. The lowest tenders amount to £4,054; the highest to £7,313. The architect is Mr. W. T. Agutter; the quantity surveyor, Mr. H. T. Neilson, both of Darlington.

POLICE OFFICE, GLASGOW.—The Glasgow Watching and Lighting Committee of the Town Council inspected the new Southern Police Buildings on the 27th inst. The building is situated at the corner of Oxford-street and Nicholson-street. It occupies an area of ground extending to 2,300 square yards; the site cost £12,000, and the contract for the erection of the building amount to £25,000. There are the usual requirements of the Police Department—court hall, magistrates' room, muster hall, witnesses' room, fifty-five cells, to accommodate 100 prisoners, instead of seventy as formerly. Within the buildings there is also barrack accommodation for forty-five constables, with kitchen, mess-room, and reading room. The Lighting Department will also find accommodation in the new building. There is accommodation provided for the collector of assessments for the south side of the river, and for the registration of births, deaths, and marriages. The plans were prepared by Mr. A. B. McDonald, City Engineer. Mr. Gray was clerk of works.

NEW WING, DEVON AND EXETER HOSPITAL.—Mr. A. O. Silfiant laid the foundation-stone on the 27th inst. of a new wing which is being erected at the Devon and Exeter Hospital. The architect is Mr. Charles Cole. The length of the new wing, including the sanitary towers, will be about 140 ft., and from the ground to the ridge the height averages 60 ft. The main walls will be of brickwork 18 in. in thickness throughout, and the roofs are to be covered with special slates. The wing will be three stories high, and consist of three main wards, each containing 24 beds, and three small single bed wards. The main wards are to be 97 ft. long and 26 ft. 6 in. wide. The floors are to be formed of steel joists with concrete and terra-cotta linings on which will be laid teak floor boards. At the further end of the wing will be a balcony on each floor and a fire escape staircase. The space underneath the wards will form a covered airing ground. Each floor has a linen-room, kitchen, pantry, &c., and in the towers are bath-rooms, lavatories, &c., and the walls of which are to be lined with white-glazed bricks inside. A lift will be provided running from the basement to the top floor for patients and dinner-wagons. The present wooden staircase will be removed, and one of iron and concrete constructed in its place, connecting the main building with the wing. In excavating for the foundations, in addition to the old cellars found, several deep pits had to be sunk, as it was discovered that the lower end was honeycombed by old brick barrel drains. The building contract is being carried out by Messrs. Tree & Bolley.

PRESBYTERIAN CHAPEL, NEWPORT, MON.—The foundation-stone of a new Presbyterian Church was laid on the 27th inst. by Lord Tredegar, in Caerleon-road, Newport. The style of the building is Early English. It is to be built entirely of stone, the front being of finished stone shoddies, and the dressings of Bath stone. The tracery window to the chancel is the main light. Provision has been made for an extension of the structure when the necessity arises. The dimensions of the present building will be:—Length, 64 ft.; width, 40 ft.; and height from floor to ceiling, 50 ft. The roof is of open timber, and a gallery is to be erected at one end, capable of extension round two other sides. The sewage accommodation will be for about 270. The work is being carried out by Messrs. A. S. Morgan & Co., from designs by Messrs. Graham, Hitchcox, & Co., Y.M.C.A. BUILDINGS, BELFAST.—The foundation-stones of the new buildings which are to be erected in Wellington-place for the City of Belfast Young Men's Christian Association were laid on the

27th inst. The block of buildings comprises a frontage of 86 ft. to Wellington-place, and a depth of about 230 ft. A modified Gothic has been chosen as the style of the new edifice, and it will be executed in Belfast red Annadale brick facing, with Dumfries sandstone used sparingly in the string-courses, battlements, and copings. A special feature is made of the ground-floor frontage, which is carried out in polished red Shap granite columns and pilasters supporting cut-stone arches and blockings at both entrances on each side of the main doorway. Above the doorway rises an octagonal tower, which is braced into a circular one at the level of the main cornice, and terminates in a blocking, with battlements, at a height of 100 ft. The sky-line is further broken up by three gables, the highest of which has a weather copper vane at an elevation of more than 100 ft. from the pavement. Between the gables are placed octagonal turrets, corbelled out and finishing with conical copper high-pitched roofs. The windows on the first and second floors are formed into oriels which terminate in battlemented copings and flat lead roofs, to which access is obtained from the large circular-headed windows of the third floor. The main entrance corridor is 10 ft. wide, and extends from Wellington-place, a distance of 170 ft., to the great hall, 82 ft. by 60 ft., with galleries round three sides, having its front towards Wellington-street, and accommodating 1,300 persons; two large emergency doors, 6 ft. wide, are placed, opening on this street. Half way down the main corridor is the entrance to the gymnasium, 90 ft. by 50 ft., with a narrow gallery extending right round it. Another entrance is also afforded direct from Wellington-place, which also gives access to a staircase to the several suites of offices to let, which will be alternately added to the rooms required by the Association. The gymnasium will be fitted up with a special running track round its four sides, and have a fully-equipped set of baths, lavatories, and instructors' room. The offices of the association are situated between the main corridor and the gymnasium, and adjacent to the main staircase.

A special feature of the ground-floor plan is the cafe, about 40 ft. by 30 ft., placed beside the main entrance, and having a large ladies'-room behind it. The remainder of the frontage is taken up with two shops and the entrance to the gymnasium. On the first floor is placed the reading-room, above 40 ft. square. The minor hall, 74 ft. by 30 ft., is situated at one side of the upper portion of the gymnasium, comprising gallery and dressing-rooms. The second floor has two parlours, with similar offices to let, as on the third and fourth floors. The third floor contains a number of apartments for class-rooms, kitchens, and other purposes, whilst under the roof is planned a photographic gallery. The whole contract will be carried out by Messrs. William McCammond & Son. The plumbing will be done by Mr. J. Dowling, King-street, and the architects are Messrs. Young & Mackenzie.

RESTORATION OF DAWLISH PARISH CHURCH.—The second section of the restoration of Dawlish parish church will probably soon be proceeded with. The architect is Mr. S. Dobell. The first portion of the restoration was carried out under the direction of Mr. Piers St. Aubyn, the cost of which was between 7,000l. and 8,000l., exclusive of the chancel window and reredos. Several new stained windows have since been placed in the church.

SANITARY AND ENGINEERING NEWS.

SEWAGE SCHEME, BOWNESS.—Mr. G. W. Willcocks, one of the inspectors of the Local Government Board, has just held an inquiry at the Institute, Bowness, in connexion with an application by the District Council for leave to borrow the sum of 4,000l. for the purpose of sewage disposal, the scheme adopted by the Urban District Council being that known as the International process. Mr. G. Gately, the Clerk to the Council, stated that the normal population of Bowness was 2,062, and the maximum summer population 4,500. It will be remembered that the Bowness District Council figured some time ago at the Appleby Assizes, the result of that trial being that a limited time was allowed for the carrying out of a purification works. The Council having visited and inspected many schemes, finally decided upon the International process as being best adapted for their district. Messrs. Lomax & Lomax, civil engineers, Manchester, being engaged to carry out the scheme.

HERMITE SANITATION, NETLEY HOSPITAL.—The War Office have instructed Messrs. Paterson & Cooper, engineers, of London, to proceed with the erection, at Netley Hospital, of the Hermite Sanitation plant, the cost of which has been provided for in this year's Parliamentary estimates. The Corporation of Cape Town have also ordered a plant for producing electrolised sea-water, with a view to the Hermite process being applied to the sanitation of Cape Town.

WATER SUPPLY, GRETTON, GLOUCESTER.—The Rural District Council of Winchcomb (Gloucester) have called in Mr. J. E. Willcox, C.E., of Birmingham, to report and advise on schemes of water-supply for the villages of Gretton and Guiting Power.

WATER SUPPLY SCHEMES, STRATFORD-ON-AVON DISTRICT.—The Stratford-on-Avon Rural District Council have instructed Mr. J. E. Willcox, C.E., of

Birmingham, to submit schemes of water-supply for the parishes of Alveston, Tiddington, and Moreton Morrell, within their district. The Council have also decided that the whole of the house drainage works in connexion with the new sewerage scheme of Henley-in-Arden shall be carried out by the contractor to the works, Mr. Griffin, of Henley-in-Arden, under the supervision of the engineer, Mr. Wilcox.

WATER SUPPLY, LOSTWITHIEL, CORNWALL.—The completion of a scheme for a new water supply at Lostwithiel has just been celebrated. Messrs. S. W. Jenkin & Son, of Liskeard, devised the scheme, which provides for the collection of the water from three springs into a reservoir, the capacity of which is 40,000 gallons. The water is conveyed by a natural fall through a 4-in. main, and enters the town at the corner of the "Talbot Hotel." The reservoir is 200 ft. above the highest part of the town, 300 ft. higher than the point at which the water first enters the borough; and 350 ft. above the lowest part of the town. The contractors were Messrs. Oliver & Minner, of St. Blazey.

THE SHAFESBURY ELECTRIC RAILWAY, ISLE OF MAN.—This railway was opened on the 21st inst. The new station occupies a site in the centre of Laxey, near to the lead-mining works. One of the principal difficulties which the promoters have had to face has been a gradient of one in twelve. The engineer, Mr. Fell, C.E., devised a system which provided for the laying of a central rail along the track. This rail is somewhat higher than the bearing rail, and heavier. By this means, not only do the cars run more steadily, but absolute safety of descent is assured by means of a gripper-brake upon this central rail, in addition to an ordinary brake upon each of the eight wheels of the car. The cars are comfortable structures, giving seats for eight passengers, are entered at the ends, and forty-eight passengers, are entered at the ends, and run upon eight wheels. The generating plant consists of four Lancashire boilers of 150 h.p. each, and five horizontal compound engines of over 100 h.p. each. These drive five kilowatt dynamos. They are of the Mather and Platt type, with Edison-Hopkinson magnets, and "Manchester" armatures. The ascent of 4½ miles is made in half-an-hour, and the descent less time.

GLOSSOP SEWAGE SCHEME.—Mr. J. W. B. Clarke, M.Inst.C.E., conducted a Local Government Board inquiry at the Town Hall, Glossop, on Tuesday last respecting the application made by the Glossop Corporation for sanction to borrow 44,000l. for works of sewerage and sewage disposal. The scheme submitted for the consideration of the Local Government Board includes the sewerage of the entire borough, and also the carrying out of outfall purification works. The scheme has been prepared by Messrs. Lomax & Lomax, civil engineers, Manchester, and is calculated to deal with the sewage from a population of 30,000. The precipitation tanks will be on the continuous upward flow principle, the effluent therefrom being passed through polarite filter-beds. The application was opposed by Mr. Fox on behalf of Messrs. Potter & Co., of Dinting Vale Print-works, the contention of Mr. Fox being that the whole of the dye and bleach waste water should be admitted into the Glossop sewerage system. The Corporation having refused to deal with this waste water on the grounds that it would injuriously affect the treatment of the sewage at the outfall works, Mr. Fox gave notice that if in carrying out the scheme the Glossop Corporation omitted to provide facilities for the reception of this waste water into their sewers, Messrs. Potter would then at once apply for a mandamus to compel the Glossop Corporation to do so.

FOREIGN AND COLONIAL.

FRANCE.—M. Ernest Barrias, the sculptor, has just completed the monument to Emile Augier, to be erected in the Place de l'Odéon, by public subscription. The monument will probably be erected in October. The monument to the memory of President Carnot, at Fontainebleau, is to be inaugurated. M. Peynot is the sculptor. A "royalist" committee has erected, opposite the celebrated church of Sainte Anne d'Auray, a monument to the memory of the Comte de Chambord. The monument, which is just completed, includes a large pedestal ornamented with four statues, representing Jeanne d'Arc, Bayard, Duguesclin, and Sainte Geneviève; above this is the kneeling statue of the Prince, looking towards Sainte Anne d'Auray. The fine statue of Henri de la Rochejaquelein, by M. Falguière, an illustration of which was published in the *Builder* in July last, is to be erected at Baubigné (Deux Sèvres), towards the end of next month. Two painters, MM. Castellani and Victor Meunier, have applied to the organising committee of the 1900 Exhibition for space for an immense panorama in which they intend to represent the depths of the sea ("abîmes sous-marins"). The death is announced of M. Ch. E. Bailly, the sculptor, author of the statue of the Abbé Grégoire which was erected some years ago at the Château of St. Germain-en-Laye, suspended for a good while back, have now been resumed under the direction of the department of "Monuments

Historiques," and it is expected that the reconstruction of the chapel and of the adjoining turret will be completed shortly. A steel bridge is to be constructed over the Seine at Melun, for the passage of the new line of railway from Corbail to Montreuil. It will be carried on four stone piers.

GERMANY.—The twenty-fifth anniversaries of the principal events in the Franco-German war have given occasion for the erection of a large number of monuments throughout Germany. In many instances we hear of new memorials to the Emperor William, and the great statesmen of his time, or of monuments to generals, and officers, or privates of certain regiments. The memorials are of a most varied form, from the elaborate equestrian statues of the larger towns to the plain memorial fountains, tablets, &c., of the smaller communities. The Royal Botanical Gardens at Berlin will now be definitely transferred to a suburb. The present grounds in the Potsdamer-strasse are to be sold for building purposes, but there is a movement to retain this space as pleasure-gardens. In London voluntary subscribers would be easily found to retain this popular site, but at Berlin the Municipality are expected to find the money. North Sea and Baltic Canal will be kept open for the usual traffic during the winter months, but the passage rates will be raised 25 per cent. on account of the extra expenditure this occasions. The Dortmund-Ems Canal, which will be an important part of the proposed Central German Canal system, is making rapid progress. About 9,000 cubic yards of soil have been excavated, and 1,500,000l. spent. The estimated cost of the canal is 3,500,000l. No progress has, however, been made with the Rhine Dortmund Canal, which will also form a part of the system. Messrs. Siemens & Halske have now prepared further plans for a second electric railroad, which will serve as an "outer circle" line in connexion with the Metropolitan Railway, for which they have already obtained the necessary concessions from the authorities. At Stuttgart, a competition has lately been decided for the new Town Hall. The jury did not give the first premium, but there were three second premiums of 250l. each, two third premiums of 150l. each, two fourth of 100l. each, and a number of minor ones (50l. each). Messrs. Reber & Kaufmann (Frankfurt), Messrs. Kuder & Müller (Strasbourg), and Messrs. Volmer & Jassoy (Berlin) won the three 250l. premiums. This is the second competition for a large Town Hall during the last twelve months, and the sites and conditions were very similar. There were 202 competitors. The site was practically 200 ft. square. Of other competitions at Stuttgart, we would notice one for laying-out the historical Friedrichsplatz, on which a substantial sum is to be spent. Dessau and Jauer are to have a new Town Hall, and a competition has been opened for the design. A competition for a Town Hall at Hanover has also been opened, and 1,800l. is to be given as a premium. The first premium will be 600l., and the second 400l., so that a large number of designs are expected. A very influential committee will act as assessors. A competition has been opened for the plans for the exhibition grounds at Kiel. This exhibition, though an industrial one, will be of special interest to naval men, as the shipbuilders of Europe will be well represented.

SAXONY.—Dresden is to have a Bismarck monument, costing 5,000l., and a competition has been opened for the design. Premiums of 200l., 150l., 100l., and 50l. respectively will be given. Professor Wallot, who holds the Architectural Chair of the Saxon Royal Academy, has now practically definitely settled at Dresden, and only visits Berlin to attend to the completion of the new Houses of Parliament. His next commission will probably be from the Saxon Government, for a new home for the Diet of the Kingdom of Saxony. The designs Professor Wallot has prepared show some interesting planning, and the rendering of the façades is in keeping with the surroundings of the site, which is on the historical Brühlische Terrace. One of the halls in the old building is to be retained in the new block, and this causes some difficulty. There will be an Art Exhibition at Dresden next month, and a large International Art Show is being arranged for the summer of 1897. The extensive works of altering the number of lines of railway which pass through Dresden, and making an extensive central station, are now well in hand, and one of the halls of the new station and some of the administrative blocks are nearly ready. The works are being carried out under very difficult conditions, as the through traffic has to be carried on as usual. The competition for the design of the Saxon Industrial Exhibition, which will be held at Leipzig, has been won by Herr Teichmann. The historical castle Fleissenburg, which is situated in one of the busiest parts of Leipzig, will now have to be pulled down to make room for a new town hall and block of tenements. The old castle turret will alone remain, and is to be used as a central feature for the new Town Hall. A competition is being held for schemes showing the arrangement of the site. Dresden is following the Berlin example by opening a competition for the designs of new lamp-posts on the market place. Some substantial premiums will be given, including three of 100l. each.

MISCELLANEOUS.

AWARD OF EVENING EXHIBITIONS IN SCIENCE AND TECHNOLOGY.—From the *London Technical Education Gazette*, the official Circular of the Technical Education Board of the London County Council, for August, we take the following:—"The following list gives particulars of the candidates to whom Evening Exhibitions of 5l. per annum for Science and Technology have recently been awarded. The Exhibitions are awarded in the first instance at one year, but are renewable for a second year at the option of the Board. The exhibitors are required to attend evening classes in science or technology in institutions approved by the Board, and the Exhibition is intended to cover the class fees and expenses incidental to attendance. For this examination 256 candidates sent in their names, and 223 presented themselves. . . . The examination on the first evening consisted of an easy arithmetic paper, occupying two hours, followed by an hour's English composition, the paper was affording opportunity for every candidate to write on some subject with which he or she was familiar. The second evening was devoted to drawing, the candidate being required to make freehand sketches from memory of a few very familiar geometrical figures, and to draw a paper devoted to very easy geometrical and constructional drawing. On the third evening papers were set in the several special subjects selected by the candidates, and comprised: Chemistry, mechanical engineering, mechanics, mathematics, general physics, electricity and electrical engineering, practical geometry, machine construction, building construction, botany, physiology, biology, hygiene, navigation, plumbing, metal-plate work. Of the candidates forty-six submitted drawings and twenty submitted specimens of practical work in addition to sitting for the examination. Of these candidates twenty-two were adjudged worthy of exhibitions on the merits of their works, but nine of these had been exhibited on the results of the examination. In the few cases in which fairly good drawings were submitted by candidates who entirely failed in drawing in the examination no credit was given for the submitted works. The papers sent up by the candidates in the examination differed very widely indeed in merit, and the submitted works were of many kinds. In many cases the practical men showed their knowledge in the sketches they sent up in answer to the questions on building construction and machine construction. These papers and the paper on practical geometry were, as a rule, answered far better than most of the other papers, but it was apparent that a very large number of the candidates who selected these technical subjects had derived their knowledge wholly from attending classes, and had no practical acquaintance with the trades concerned, while it was still more apparent that a very large number of the candidates had attempted to build a superstructure of technology on a very poor foundation of arithmetic and mechanics. In the arithmetic thirty candidates obtained less than 20 per cent. of the total marks, and eighty obtained less than 30 per cent. On the other hand, in the whole examination, out of a maximum of 900 marks two candidates from the People's Palace obtained 757 and 744 marks respectively, while a candidate from Regent-street Polytechnic obtained 715 marks and another from the same Polytechnic obtained 641 marks in electricity. An interesting example of learning in class only was afforded by one candidate, who made a drawing of a tusk tenon for a trimmer upside down. Of the seventy-seven candidates fifty-six have been trained in London Polytechnics, including under that title the Birkbeck Institution and the City of London College, which form parts of the City Polytechnic, and eleven have been students in Evening Continuation Schools, leaving only ten who have come from other institutions or have relied on private study."

DRINKING FOUNTAIN, NEWCASTLE.—The water has been turned on to the Laing Drinking Fountain, which has been erected to the memory of the late Mr. W. Laing, directly opposite the Blue House and the top of Matthew Bank, but what is now known as Pandon Dene-road. The fountain is of Peterhead granite, the greater portion of it being polished. It consists of a round column several feet in height, on the top of which is a large spherical stone of the same material, the whole being surmounted by a metal shaft of floral design. The fountain is a monument for supplying water to wayfarers, there is a drinker trough for cattle, and a smaller one for dogs. The sculptor was Mr. R. Beall, Newcastle.

SEWAGE DISPOSAL IN FRANCE.—The subject of sewage disposal is now receiving some attention in France. Last year at the Boulogne Exhibition Mr. H. Howson showed a small installation of the Barozze-Polarite system of sewage treatment. Two Commissioners, MM. Genis and Rebuffet, were appointed to visit England to see the process in question in operation, and also other processes of sewage treatment. In the course of their visit, amongst other places, they inspected Royton, Hyde, and Huddersfield. They also visited Manchester, Salford, Sheffield, and Lincoln. As a sequel to the demonstration at Boulogne and the report of the engineers who acted as Commissioners, the Municipal Council of Rouen, by a

of 22 as against 3, have decided in favour of scheme, submitted by Mr. Howatson, C.E., lines very close to the houses, except at Huddersfield, viz.:—Precipitation by ferrous filtration through polarite, but before carrying his scheme it was decided to visit England. In accordance with this decision the Mayor of (M. Laurent) and a numerous deputation England on the 10th inst. and commenced tour of inspection. In the morning they left for the Royal Sewage Works. During the full details of the process were given by the man and by Mr. T. S. McCallum, C.E., hester, the engineer of the scheme. After noon at the Railway Hotel, Royton, the Mayor proceeded to Chorley to inspect the new designed by the Borough Engineer, Mr. C.E., for the treatment of the sewage of the town. The Chairman of the Sewage Com., Mr. Alderman Hibbert, J.P., received the Mayor on arrival at the Chorley Station, and drove them to the sewage-works, where a inspection of the various details was made, taking a visit to the Chorley Sewage Farm. On the 10th inst. the deputation visited the Wigan Sewage Farm, where they were received by the Mayor and other gentlemen of the Corporation. A careful inspection of the various parts, the Mayor and left for Huddersfield, reaching that town on the evening of the 20th. Their stay in Huddersfield they were the Mayor. The Borough Engineer, Mr. Dugdale, C.E., met the deputation on the morning of the 21st inst. and they proceeded to the Royal Aquarium on September 10, to the Town Hall and welcomed by the Mayor of Huddersfield, by whom they were entertained to luncheon along with several members of the Council.

EXHIBITION OF OLD AND MODERN CHINA AND JAPAN.—An exhibition of old and modern china, pottery, antique and humorous art, will be held at the Royal Aquarium on September 10. The curious exhibits are some monumental vases taken from the Emperor's Palace at Peking; were at one time the property of General Gordon. A number of the Nelson relics will also be on

ST. THURLES CATHEDRAL, IRELAND.—A clock has recently been erected in the tower of the Cathedral, Ireland, which chimes the quarters, strikes the hours, and has three dials. It is a gift by Archbishop Croke, and is by John Smith & Sons, Midland Clock Works, carried out the work.

NEW ENTRANCE TO ORMEAU PARK, BELFAST.—Design for the new entrance to Ormeau Park is of two pairs of carriage entrance gates, 12 ft. wide, and two side gates for foot passengers, each 6 ft. wide. The entrance proper is 64 ft. across, and the total length of the Ormeau-road, including the wing is about 116 ft. The central feature of the pier is a stone pier rising to a height of almost 10 ft., enriched with pilasters set on the angles, moulded and carved caps and bases, surmounted by a cornice moulded and enriched, flanking with a coronal carried on scroll-work. The face of the pier has the Belfast Arms carved raised panel. The side footway gates are each 12 ft. stone archway, 12 ft. high and 13 ft. 6 in. The side wings have a base and plinth newwork, with cut-stone piers at intervals, and a between the piers being filled up with iron-panels corresponding in design with the work of the gates. We understand the iron has been designed by Messrs. Brawn & Co.'s (Birmingham), whilst they have had the advice of a local architect, Mr. W. J. Gilliland, who has designed for them the general scheme of the entrance and the stonework.

"INVICTA" BRICK-MAKING MACHINE.—A 22nd inst. a number of people interested in making machinery met at Southall (Middlesex) to inspect a machine practically new to this country known as the "Invicta"—and to look over the erected kilns and plant for turning out bricks by a semi-dry process. The clay used, and in a field close by the works, is known as "clay," it contains small quantities of silicaceous matter and there minute nodules of "racc." This sand in wet seasons conveyed to drying sheds, where what were described as such; in reality, are only plots of ground roofed over, and in rather would afford but little protection. After hot dry weather the clay is dug and sent direct to mill, being taken from the face of the clay, up an incline by means of an endless belt actuated by steam-power. The clay when actually treated in the mill passes into the "Invicta" machine and during the process is mixed with a certain quantity of "brick-dust." There it is broken down, so to speak, and brought under the machine, when it is subjected to great pressure and the semi-dry brick is ready for burning. The machine has two dies and can thus deliver two

bricks at a time. It struck us that it worked very slowly, and some slight improvement is needed to get rid of a sort of rim which necessarily forms all round the edges of the top of the pressed brick in consequence of the dies not fitting exactly into the bed when pressing. At the present time the rim is roughly removed by hand. The unburnt bricks are very hard, and are taken direct from the press to the kiln to be burnt. The admixture of brick-dust was said to assist in the more thorough burning of the brick; for our part we think no improvement in that direction could be effected thereby. But no burnt bricks were available for inspection to enable us to elucidate this point, which was rather an oversight on the part of the management. An enormous improved Hoffmann kiln has been erected, and large machinery shops are being put up close by, so it is evident that the neighbourhood of Southall will become even more noted than at present as a brick-producing centre. The "Invicta" machine is of Australian origin.

SHEFFIELD STREETS.—At a recent meeting of the Sheffield Town Council, a discussion arose on a recommendation of the Highway Committee to the effect that the present rule of requiring paving in every street might be modified to the extent of allowing macadam in suburban roads or streets where the gradient is not steeper than 1 in 25. Where the gradient is steeper, and in all populous districts, they are of opinion that sets should be insisted upon. They also consider that flagging for footpaths should be required in all cases. From the report the City Surveyor presented to the Council in August last, it appears that there were 76.56 miles of unadorned streets in the city, and 215.5 of dedicated streets, a total streetage of 292.06 miles. Several miles of streets previous to 1888 had been accepted by the Corporation with asphalted footpaths and macadamised roads. Extensive repairs on streets constructed in this manner became necessary in a short time after their dedication, and the committee thought that a more durable and better class of construction should be asked for. They considered that when the streets were taken over, they should be constructed in such a manner that it would be a long time before any further expense was thrown on the ratepayers. The initial expense, they thought, should be borne by the property owners. They set about obtaining information from other towns as to the method of construction adopted, and found that in very few of the towns was macadam allowed for streets which were to be taken over as public streets. In nearly all towns also, flagging was insisted on for the footpaths. They, therefore, after consideration, decided that for the health of the inhabitants and in the interests of the ratepayers, a different method of construction should be adopted, and should follow on the lines of other towns. It was found from experience that asphalted footpaths would not be sufficiently durable, and that the macadam of the roads would very soon require repair, and that besides this in steep streets, such as exist in many parts of Sheffield, the surface would become washed off in times of heavy storms and find its way into the sewers, necessitating frequent repairs to the surface of the streets and the expenditure of large sums of money in extracting the road-debris from the sewer. Property owners were therefore asked to pay a much larger sum per foot frontage of streets than they had previously done. The ratepayers, on the other hand, would have less to pay than in the past by the rates being relieved of the maintenance of these roads for some time to come. The property owners have naturally objected to this change, and they complain of the great cost of the work. This, however, in view of the cost imposed in other towns, is a complaint without much justification, for the price charged in Sheffield compares favourably with the rest. The question appears to be one in which the interests of property owners and those of the public are in danger of clashing.

In the past the ratepayers have been called upon to expend money in the repair of defective roads sooner than they should have been. Many look upon this as one of the reasons why the rates are so high. Most experts, and those who have made a study of the question, are of opinion that the streets should be paved (except those in the country) and the footpaths flagged, and that in all cases before the paving is done the sewers should be taken up and examined and relaid, as there are many miles of street that have sewers in them formed of old rubble. Many of these in Sheffield are very dilapidated and very leaky. It is also desirable that causeways should be flagged, because it is much more durable than asphalt. The Sheffield Corporation themselves are asking for 4,000 ft. for the purpose of taking up some of the old macadamised roads and reconstructing them in granite sets. During the last six or seven years, according to statistics recently furnished to the corporation, upwards of six and a-half miles of streets have been taken over, and plans are now in hand dealing with the dedication of six more miles of streets. The six miles represent ninety streets. Many of these are at present unpaved and unflagged, and in an unsanitary condition. In order to enable the subject to be fully discussed and dealt with, the Highway Committee instructed the City Surveyor to obtain particulars respecting private street works. These have been obtained and summarised from a number

of other towns. From the statistics given it appears that only in two out of the twenty-two towns is macadam allowed except in special cases, and generally sets are required similar to, or better than, those used in Sheffield. It also appears that in nearly every town the causeways are flagged, the exceptions being where either blue bricks or rock asphalt are allowed. Notwithstanding the strong recommendation of the Committee the Council decided to throw it over.—*Sheffield Independent.*

COMPLETION OF BURNS' STATUE, Ayr.—On the 21st inst. the last of the four panels at the base of the George A. Lawson statue of Burns was unveiled by Mr. Wallace Bruce, formerly United States Consul at Edinburgh. The statue was unveiled on July 8, 1891, by Sir Archibald Campbell of Blythswood. Since then three panels have been placed on the plinth or die of the monument. These were:—"I am o' Shanter at the Brig o' Doon," "The Cotlar's Saturday Night," and "The Jolly Beggars." The fourth panel is the gift of twenty-five Americans. Dealing with "The Parting of Burns and Highland Mary," the panel is the work of Mr. George E. Bissell, an American sculptor resident in Paris.

MOSAIC PAVING, IPPLEDEN CHURCH, DEVON.—Ippleden Church floor has just been paved with mosaic. The chancel walls have been cleaned and freshly coloured. All has been done under the guidance of Messrs. Tait & Harvey, architects, Exeter, and the work carried out by Messrs. Packer, of Newton Abbot.

SUPPLY OF WINDOW BLINDS TO THE GOVERNMENT.—Messrs. Tidmarsh & Sons, of Islington, have obtained the contract with H.M. Government for the supply of window blinds for the next few years.

LEGAL.

ALLEGED BUILDING TRESPASS:

CASE IN THE VACATION COURT.

The case of Woodhead v. McDonough on Tuesday last came before Mr. Justice Mathew sitting as Vacation Judge, it being a motion for an injunction to restrain the defendant from committing an alleged trespass on the plaintiff's premises, in breaking into part of a wall so as to obstruct the plaintiff's flue, and also to restrain the defendant from endangering the plaintiff's premises by fire or smoke.

His Lordship, addressing Mr. Stuart Smith, who represented the plaintiff, said that it was not a matter which could be settled by him.

Mr. Stuart Smith replied that he was going to suggest to his learned friend who represented the defendant whether he could not give an undertaking in the terms of the latter part of the notice of motion.

His Lordship: "Not to endanger?" That cannot be done unless some person is called in to say whether what the defendant has done is calculated to endanger.

Counsel for the defendant said that it did seem, on the evidence, that there was one particular fireplace which had caused some discomfort to the plaintiff by reason of the defendant having burnt shavings in it. The defendant would undertake not to burn shavings in that one particular grate.

His Lordship: Or anything else?

The learned counsel assented, and said that there was an empty grate which would be filled up.

His Lordship: Is that the worst part of the cause of action?

Mr. Stuart Smith replied that there were two points in the case. One was, that the defendant had broken into the plaintiff's flue.

His Lordship: What do you suggest should be done?

Mr. Stuart Smith said that he should suggest that the defendant should remove an obstruction which he had placed in that flue. The defendant was building a new floor, and one of the joists supporting that building had got into the flue and so obstructed the chimney, which caused it to smoke. The defendant had built a fireplace on his first-floor, on the other side of the flue, and had used the flue for a chimney, putting in a flag which covered the plaintiff's chimney, causing it to smoke.

His Lordship said that he was afraid he could not assist either of the learned counsel to be reasonable in the matter. The defendant must not leave the flag there. It was a very important matter for him, because he would be subject to damages if he was wrong.

Counsel for the defendant said that his client wished that the matter might stand over for a fortnight in order that he might in the meantime reply to the plaintiff's evidence.

His Lordship: No, no; in order in the meantime that you may do your best to remedy the defect. I shall not expect to see either of you gentlemen again in this case, and I sincerely hope I shall not. I want you to settle this matter if you can, and I therefore direct that it shall not again come into the paper unless you, or one of you, certify that it must.

In the event of a settlement not being arrived at, his Lordship directed that pleadings should be delivered during the Vacation, and gave liberty to apply to expedite the trial.

15,834.—BRICKS: *H. Wood*.—This invention relates to the production of improved bricks from plastic clays. The clay is first mixed with some kind of combustible material

[Contractions used in these Lists.—F.g.r. for free ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for r.f. for freehold; c. for copyhold; l. for leasehold; a.r. for estimated rental; u.t. for unexpired term; p.a. for annuum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

AUGUST 13.—15.191. E. Radclyffe, Window.—15.200, J. Smith, Ventilation of house drains, sewers, &c.—15.231, W. Buck, Hollow Walls, and the method of constructing them, and in hollow, tubular, or perforated bricks therefor, and in the application thereof for ventilating, heating,

AYLESBURY.—For repaving Cambridge-street, for the Aylesbury Urban District Council. Mr. J. H. Bradford, Surveyor, Aylesbury.

As rate.	Relaying of Granite Setts.	New gln. by gln. Mossesorel Granite Setts.	Gully Pans and Gratings.	Connecting Gullies to Sewer.	Lighting and Waching.
	s	d	£	s	£
	1	6	2	0	5
	2	8	5	0	6
	1	3	2	0	5
	1	3	0	10	0
	1	3	7	0	1
	1	6	0	0	0
	6d. per square yard.			nil.	nil.
for a ceptance.					
LONDON.—For an improved sanitary system, &c., at 10, Pen- worth-road, St. James Court, for Mr. James Hunt, Mr. J. W. Ayn- sley surveyor, 14, Green-street, Chesham, E.C.—					
Stamps on Survey	£ 254	0	5	0	259
Slating & Slat	297	0	W. Mills (percepted)	0	245
LONDON.—For the exterior painting of Lant-street Board- School, for the School Board for London. Mr. T. J. Bailey, Archi- tect—					
Lant Bros.	£159	0	Nightingale	£38	0
Gilling	135	0	Johnson & Co.	59	0
Dove Bros.	135	0	Kid-Kent Building Co.	89	0
Lock & Hooker	124	0	Marsant & Hirst	84	0
LONDON.—For exterior painting of Netherwood-street Board- School, for the School Board for London. Mr. T. J. Bailey, Archi- tect—					
Verbury & Son	£18	0	Chinchin	£176	15
Chapman	198	0	Lewis & Maso	155	0
Levi	193	0	Clayton	125	0
Callow	180	0	Marsant & Hirst	143	0
Saline	184	0	Eady	147	5
LONDON.—For exterior and interior painting of Victoria-pa- rading School, for the School Board for London. Mr. J. J. Bailey, Architect—					
Heavens Bros.	£59	0	McCormack	£44	0
Marsant & Hirst	156	0	T. Craway	17	0

LONDON.—For the exterior painting of Fritchard's-road Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Crailig	£245	White & Son	£127
Harvey	23	Marchant & Hirst	118
Birk & Son	137	Harrison & Spooner	100

LONDON.—For exterior repairs and painting of Faincombe-street Board School, for the School Board for London. Mr. T. J. Bailey, Architect.—

LONDON.—For exterior repairs and painting of Finscombe Street Board School, for the School Board for London. Mr. T. J. Baney, Architect		£ 276	Johnson & Co. £149
Leak & Hooker	945	Matchant & Hirst.	117
Wood & Co.	169		

LONDON.—For exterior painting of Canal-road Board School, for the Canal-road Board for London. Mr. T. J. Baney, Architect:—
 Craig & Co. £ 272

Dove Bros.	14	0	0	Stainer & Son	118	0	0
Cornfield	735	0	0	Groves & Son	168	0	0
Gavin Bros.	120	12	8	Marchant & Hirst....	99	0	0

LONDON.—For the erection of stables, engine-room, and hay-loft, &c., Dog-glass-street, Vauxhall Bridge-road, for Mr. Flou-
 cane. Mr. Arthur A. Kemp, architect, 82, Vauxhall Bridge-road.
 Quantities by architect.

LONDON.—For the erection of stables, engine-room, and hay-tott, &c., Douglas-street, Vauxhall Bridge-road, let Mr. FLOS. CANE, Mr. Arthur A. Kemp, architect, 8, Vauxhall Bridge-road, Quantities by architect:—

Alfred	.....	£5,000	5	Goldbach	.....	4,112	0
Clemann & Co.	.....	4,338	0	battley	.....	5	0
.....	.....	4,249	0	Holness	.....	4,080	0
.....	.....	4,200	0	Cornelius*	.....	3,960	0
.....	.....	4,160	0				

* Accepted subject to modification.

LONDON.—For new shop-front at 24, Stamford-street, Black-
 nias, S.E. Mr. H. E. Bridgman, architect, 42, Foultry, E.C.
 Quantities by Mr. S. G. Goss, 10, John-street, Bedford-row, W.C.

.....	£ 389	H. Brown	£ 297
.....	384	J. Harvey	297
.....	365	J. O. Richardson	270
.....	355	MacLachlan & Sons	270
.....		1 estimate	

N.-W. BROMPTON (Kent).—For the erection of twenty villa residences. Mr. E. J. Hammond, architect, 111, High street, New Brompton.		
West Bress.	..... £5,250	o Horsecroft & Mills
A. L. Treadman	..... 6,100	o C. E. Skinner
W. J. L. Jones	..... 5,800	o H. Harris, New Brompton
Wilford	..... 5,600	o F. Hammond
E. E. Smith	..... 5,580	o G. E. D. Woolfard
A. Weymouth	..... 5,580	o

* Architect's estimate, £5,520.

NEWCASTLE (Staffs).—For the erection of five houses, North-
ote-place. Mr. Elijah Jones, architect, 10, Albion-street, Hanley.
quantities by the architect —

John York & Thos. Good-	C. Comes	£4 200
win	I Godwin	4 200
£4.500		

F. Emurey	4 44	C. Cope, Funstn*	4 00
W. Gallmore	4 25		* Accepted.

NEWCASTLE-ON-TYNE.—For alterations, &c., to Primitive Methodist Chapel, North Seaton. Messrs. Davidson & Bendle, Architects, 35, Grainger-street West, Newcastle-on-Tyne:—

J. N. Heatley, Delaval-terrace, Blyth, Northum.

NEWPORT PAGNELL.—For the erection of school buildings, for the School Board of Newport Pagnell (Bucks.). Mr. Wm. Hall, architect, 12, St. Giles street, Northampton. Quantities by architect.—
White £9,680 0 0 | Green Bros. £8,550 0 0

Wheeler	8,235	14	0	Fathers	8,393	16	0
Wheeler	8,957	0	0	Heap	8,343	0	0
Wheeler	8,663	0	0	Sturge & Sons	8,171	18	3
Wheeler	8,678	0	0				

ORPINGTON (Kent).—Accepted for additions and repairs to
 iron buildings. Mr. St. Pierre Harris, architect, &c., 8, Iron-
 monger-lane, E.C., and Orpington :—
 Somerford & Son, Orpington.....£298

ORPINGTON (Kent).—Accepted for the erection of a pair of
 labourers' cottages, and for other works of repair, &c. Mr. St.
 Pierre Harris, architect:—
 Stubbings & Pannett, Sidcup £454

ORPINGTON (Kent).—For additions and alterations to houses:
Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-lane, E.C., and
Orpington. —
Gregory & Co. £2,175 [Somerford & Son, Chap-
man and Orpington* .. £1,699
Lawrence & Son 1,750 * Accepted.

ORPINGTON (Kent).—Accepted for erection of two detached
cottages. Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-lane,
E.C. —
Somerford & Son £1,310
[No competition.]

ORPINGTON (Kent).—Accepted for alterations and repairs to
private house. Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-
lane, E.C., and Orpington. —
Somerford & Son £950

PADIHAM (Lancs.).—For the erection of semi-detached villa
residences, Burnley-road, Padiham, for the Rev. J. Lee and Mr.
W. Heins. Mr. V. Dunkley, architect, Padiham and Burnley.
Quantities by architect:—
Ben. Smith £800 Foster & Sons £47
Waddington & Barwell, 340

PAIGINTON.—For the erection of stores, stabling, and dwelling-
house, adjoining G. W. Railway Goods Yard, for Mr. W.
Lambhead. Mr. W. G. Coudrey, architect. Quantities by
Mr. Vincent Catermole Brown. —
E. P. Bovey £2,000 H. P. Rabbich £1,001
W. Harris 2,000 Hy. Weibler & Son, ..
C. & R. E. Drew 1,988 Paiginton (accepted) 1,868

ROTHERHAM.—For the erection of police offices and courts, for
the Corporation of the Borough of Rotherham. Mr. Richard J.
Lovell, architect, 45, Queen Victoria-street, London. —
Chalwick £1,175 S. Warburton £9,200
W. Ives & Co. 10,640 A. T. Ripley 9,005
G. H. Smith 10,260 Richard Small, Rother ..
St. Snell 9,728 "ham" 9,590
W. Binn 9,442 H. Arnold & Son 9,795
Thomson & Son 9,395 1
* Accepted. † Withdrawn.

SOUTHPORT.—For the erection of the first portion of exten-
sions to "Helle Vue," Southport, for Sir George A. Pilkington, J.P.
Mr. C. Sydney Ingham, architect, Southport. Quantities by
the architect:—
Fairbridge & Hatch, £3,295 0 J. Fenton & Son, .. £3,100 0
W. H. Foster 3,231 0 Duxfield Bros. * 3,099 7 6
Wishart & Irving 3,750 0
[All of Southport.] * Accepted.

SPENNYMOOR (Durham).—For the erection of business pre-
mises, High street, for Mr. Dodson. Mr. H. Henry, architect, 11,
North Bailey, Durham. —
Robert Telfer, Cradock-street, Spennymore, County
Durham £714

SWANLEY (Kent).—Accepted for the erection of six cottages at
Moulton Hill. Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-
lane, E.C., and Orpington. —
Steebings & Pannett £1,150

TENBURY.—For the execution of waterworks (four contracts),
for the Rural District Council. Mr. W. Wyatt, engineer, Pride
Hill Chambers, Shrewsbury. —
Contract 1 of (Tanks). —

T. Preece £2,050 16 8 T. Brown, Shrews.
H. Roberts 2,018 9 0 J. Bury (accepted) £800 0 0
W. L. Meredith 225 10 0 B. Griffin 750 2 11
Davies & Son 985 3 9 G. Edwards 750 0 0
From Plans.—H. Roberts, West Bromwich £4 3 0 Accepted
on
Schedule
of Prices.
Pipe Laying.—
J. Gies and Hydrants.—Blakeborough & Sons,
Birmingham

WAKEFIELD.—Accepted for spinning mill, chimney stack, and
other buildings, at Wakefield, for Messrs. Alfred Haley & Co. Mr.
William Watson, architect, Wakefield. —
Executing, Bricks and Tiles.—Bagnall
Bros. £6,774 7 11
S. Atter.—Wm. Atkinson
Plastering.—T. C. Tattersall
Carpentry and Joinery.—Bramhall &
Broadhead
Plumbing and Glazing.—Samuel Atkinson
Ironfoundry.—Harrison & Hammond
Painting.—Chas. Turner & Sons
(Seventy-two Tenders received.)

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4s. 6d. per quarter), can ensure receiving "The Builder,"
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J. L. F.—R. S. D. (amounts should have been stated).—"Un-
decided" should have given your name and address.—H. C.
(amount should have been stated).

NOTE.—The responsibility of signed articles, and papers read at
public meetings, rests, of course, with the authors.
We cannot undertake to return rejected communications.
Letters or communications of any kind, which have been
duplicate for other journals are NOT DESIRED.
All communications regarding literary and artistic matters should
be addressed to THE EDITOR; those relating to advertisements
and other exclusively business matters should be addressed to THE
PUBLISHER, and not to the Editor.

PUBLISHER'S NOTICES.

Registered Telegraphic Address, "THE BUILDER," LONDON.
THE INDEX, with TITLE-PAGE, for Volume LXVIII. (Jan. to
June, 1895) was given as a supplement with the number
for July 13.

CLOTH CASES for Binding the Numbers are now ready, price
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READING CASES (Cloth), with Strips, price 4d. each, also
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Advertisements for the current week's issue are received up to
THREE o'clock p.m. on THURSDAY, but "Circulation" is im-
possible in the case of any which may reach the Office after HALF-
PAST ONE p.m. on that day. Those intended for the front page
should be sent by twelve noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING

DISCONTINUANCE same must reach the Office before 10 a.m. on
WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTI-
MONIALS, &c., left at the Office, but "Circulation" is im-
possible in the case of any which may reach the Office after HALF-
PAST ONE p.m. on that day. Those intended for the front page
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Working Drawing of Reredos, Catholic Apostolic Church, Gordon-square.—Mr. John Belcher, F.R.I.B.A., Architect	Double-Page Ink-Photo.
House at Oxted: Entrance Front.—Mr. R. A. Briggs, F.R.I.B.A., Architect	Double-Page Ink-Photo.
House at Oxted: Garden Front.—Mr. R. A. Briggs, F.R.I.B.A., Architect	Double-Page Ink-Photo.

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Recent Excavations on the Western Slope of the Acropolis.—II.

WE retrace our steps to the Areopagos, and take next in order the buildings on the left-hand (east) of the main road. These are of no less importance and far less complex.

The building marked A (fig. 1, page 148), is probably of Greek date, but its extent and attribution have not as yet been made out. Along the next portion of the rock of the Areopagos borders closely that there is no space left for a building of importance to intervene, where the actual rock crops up there are marks of working in the rock, the only remains of several buildings that must have occupied this corner of the Areopagos. In place the markings indicate a circular structure which may possibly have been an Odeion which Pausanias mentions near the temple of Ares. This portion of the hill has not yet been completely cleared out. At T (fig. 1), a small fragment of an early limestone wall has been found, but the remains are insufficient to make out any ground-plan. The building, however it was, abutted on the cross-road which climbs the steep incline almost due north, and that borders on the Dionyseion. At this cross-road was a public road in use, both from the fact that its pavement has been renewed again and again, and from the existence of a drainage canal beneath it.

This brings us to what is topographically, historically, and mythologically the most important discovery of the whole excavations—the triangular precinct marked Dionyseion, which we gave an enlarged plan (fig. 2), a sanctuary—for sanctuary, as we shall find it is—lies substantially lower than the level by which it is bounded, and is surrounded by an ancient polygonal wall of stone masonry, and measures about square metres. This wall is fortunately preserved; it is marked in solid black on the plan, and must be carefully distinguished from the later quadrangular wall superimposed, and drawn in double line (marked Baccheion). There are,

in fact, at this point no fewer than three periods of masonry to be carefully distinguished, and which are shown as marked on the left side of fig. 2.

These various periods can be clearly made out not only by material and character of masonry, but also by the different levels they occupy. In the early Greek work of period 1 the material is either a hard blue calcareous stone and the masonry polygonal, or Piræus stone built in quadrangular blocks. Of periods 2 and 3 the foundations only remain, and in period 3 stones of all kinds are built in, and held together with mortar. As regards the different levels, the floor of the ancient precinct (period 1) is 77.25 m. above the level of the sea, the latest (period 3) runs to a height of 79.60 m. Hence it is clear that the early Dionyseion had in Roman times got covered over with *débris* 2 mètres deep. The exact level of the early Roman buildings of period 2 cannot be determined, as the level of the floor cannot be made out.

We take the early precinct first, though, of course, it was found last, and, indeed, it owes its excellent preservation to the fact that it fell into disuse and was covered in at such a comparatively early date. The main features discovered are the precinct wall, a central altar, and, most important of all, a wine-press.

The precinct wall, owing to the fact that the precinct lay deeper than the streets by which it is surrounded, is, almost in its entire circuit, a supporting wall. Originally the difference in level was as much as 2 mètres, and this difference was augmented as time went on and the level of the roads got raised. At the north-west corner only is the precinct level somewhat higher than that of the road. The material of the wall consists throughout of polygonal blocks of blue calcareous stone, but the masonry is by no means of uniform excellence, or throughout of identical date. The difference in its character at various points can only be accounted for on the supposition that the wall underwent repairs at various periods. On the east and north side, where the higher level of the road caused substantial pressure, the wall is supported by buttresses, of which some still remain intact; only one can be certainly dated as of good Greek period; the rest from their indifferent masonry seem to have been added shortly before the ancient precinct fell into disuse.

It is remarkable that, in the whole circuit

of the wall, there is no trace of any large entrance gate. The only feasible place is at the south end of the east wall, where there seems to have been a break, and the temple within the precinct is orientated to face this way; it seems likely that the gate stood here, and that at this point only the precinct was accessible.

Standing in the centre of the ancient precinct is the foundation in *poros* stone (3 by 10 m. square) of a large altar (fig. 3);

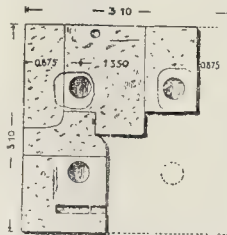


FIG. 3.—Enlarged Plan of Base of Ancient Altar.

In this foundation are four holes, 0.24 m. in diameter, and 0.10 m. deep. Of these, three remain and the fourth may be safely supplied. These holes were evidently intended for supports on which the actual table of the altar rested. Allowing that the table slab overlapped the supports about 0.20 m. we should get an altar slab of roughly 2 mètres square. This altar itself has undergone restoration, of which there are clear traces. These altar tables are familiar in vase paintings, and seem to have been specially in use in the worship of Dionysos—moreover, the actual altar slab of just such a table, 2.31 m. by 1 m., has been found in Attica, and an inscription states that it was dedicated to Dionysos Auloneus. An altar step of a similar character to this in the Dionyseion, and containing two round holes, has been discovered at Eleusis, and a partially-preserved inscription proves it to have belonged to an altar. Another important point remains. On the west step of the altar foundation a long hole is sunk in the stone. Its length is 0.49 m., its breadth 0.13 m., its depth 0.08 m. Close to it is a second similar hole, part of which is broken away. Its purpose is obvious. Both on the Acropolis and elsewhere in sacred precincts such holes are found, which served to contain stela, on which decrees, &c., were in-

side aisles. At the east end columns with bases extend in arch-shaped fashion up to the door of the apse. The purport of the small semi-circular structures in the second intercolumnal spaces remains unexplained. Nor, indeed, is the meaning clear of the star-like structures already mentioned, and which occur in the middle aisle. The main entrance to the hall was at the west end, opposite the apse. The apse must have had two doors, one to communicate with the main hall, the other with the adjoining sanctuary of Artemis. Within and near this apse several altars and a quantity of sculptures were found. Important among these remains is a large quadrangular altar, which has on three sides scenes relating to Dionysiac sacrifices worked in sunk relief. The technique of these reliefs is curious; the design is thrown on to the ground in careless experimental fashion, with little regard as to the space to be filled, but the figures of Satyrs, a goat, a bull, are full of life and a certain easy grace. These reliefs will shortly be published, so discussion may be reserved. On the fourth side is an inscription, effaced, but still legible — Κοροσφόρου παρὰ Ἀρτέμιον — in chastic characters. The mention of Artemis is important, as we have another altar with the inscription Ἀρτιμίδος Ἐπίθου and statue of the goddess was also found here. It three came to light in a small chamber adjoining the apse, in which there was an altar built of brick, and round the walls of which were a number of bases. We may, therefore, safely conclude that there was here close to the Baccheion, a late Roman shrine of Artemis, which, in all probability, succeeded to the early cult of Artemis Ἀρταία. Below this Artemision is an early polygonal structure, which may be the prime sanctuary.

In the apse close to an altar still standing right, decorated with boukrania and fruit baskets, and with an inscription unfortunately effaced, was the drum of a column which bore the now famous inscription of the Iobachchoi. This inscription, which is of the first mythological importance, has been published and fully discussed by Dr. Samide ("Mittheilungen," 1894, p. 249).* It is only to afford material for mythological controversy for some time yet, but this is not the place to attempt its further elucidation. Its importance for us consists in the fact that it is inscribed on a stele standing on a drum exactly similar to those still standing in the Baccheion. It, therefore, unquestionably belongs to the building. The inscription is surmounted by a pediment, in the centre of which is a krater, over it a bucranium, on either side a panther and a wreath with bunches of grapes. The inscription contains, in 165 lines, for the most part miraculously preserved, the statutes of the association known as the Iobachchoi. It is about the third century B.C., and abounds with curious details as to this hitherto obscure cult. After the finding of this inscription, no doubt whatever remained that the quadrangular building was the hall of assembly of the Iobachchoi.

A number of other sculptures of minor importance were found in the Baccheion. One obviously belonged there, the subjects being Dionysiac, others may have been brought there from other shrines—e.g., female reliefs, statuettes of Pan, triple caryatids, &c.

On the opposite side of the road which divides the Dionysion to the east were found the walls and the pavement of a building of Greek date. Its ground-plan is not yet fully out in full, but it is of peculiar interest, its pavement supplies us with what is probably the earliest extant Greek mosaic. The walls are so engaged with the pavement that both must be of the same date, and the walls are of early polygonal limestone masonry. The pavement is made of flat and of pebble stones, cut in half and polished.

* Since the above was written, a second important discovery of this inscription has appeared in "Orpheus," by Laass, pp. 18-22.

The colouring and patterns are of the simplest—circles, crosses, rhomboids; it would be hard to conceive anything more charming than the simplicity and delicacy of the effect. When a pail of water is thrown over the pavement the mosaic comes up as fresh and clear as though it had been laid yesterday. In two of the chambers of the building it is admirably well preserved. From the excellence of the work and the apparently large size of the whole structure Dr. Dörpfeld inclines to think we may have here a public rather than a private building, but he pronounces as yet no definite opinion.

Last on the west side of the road lies a building that came to light nearly three years ago, and to which we have more than once drawn attention, i.e., that marked on the plan as the Asklepieion (see fig. 1, page 148). The precinct borders on the footpath leading direct up to the Acropolis, and its boundary walls are of good polygonal masonry. We have noted before the sculptures and inscriptions found there, and as the sanctuary does not affect the immediate problem we need not recur to it. It was hoped that as Asklepios and the Eleusinian divinities appear together on reliefs and their cults were connected at Athens, this Asklepieion might prove to be an annex of the Eleusinion; this hope, so far, has proved fallacious. Into the mythological importance of the Asklepios heroes named we need not enter.

We pass now from fact to theory, from the discoveries actually made to—

3. Dr. Dörpfeld's interpretation of the fresh material, the new interpretation he gives of the Thucydides passage, and his revolutionary view of the topography of ancient Athens.

For the present argument we may set aside all the subordinate discoveries, the Greek and Roman houses, the unnamed buildings and precincts, even for the present, the Asklepieion, and focus our attention exclusively on the two main discoveries:—

1. The water-course system;
2. The precinct of Dionysos;

And first, the water-course system. No one disputes the fact that Dr. Dörpfeld has discovered traces of a primitive local water supply connected with the chambers at P and O, and with a number of wells. Further no one denies that he has traced out a water-course of the sixth century B.C. which debouches close to the sources of the primitive water supply, and at that date was carried no further. Few, after examining the stones on the spot, will doubt that, built into the late Roman house, are remains of a fountain structure.

Dr. Dörpfeld's explanation is briefly this. As indicated on fig. 1, the undoubted primitive water-supply is the ancient fountain Kallirrhoe, the aqueduct is that made by Peisistratos, and supplies the later fountain-house of the Enneakrunos with which Peisistratos adorned the market-place. The stones found in the Roman house actually belong to that very Enneakrunos which once stood on its site. According to this view, we have to picture the primitive Kallirrhoe issuing from the Pnyx rock immediately in front of the citadel gate. Down the narrow path facing it came the maidens to fetch water for all their household uses. The natural spring was at first abundantly adequate for the supply of the small community. The spring had no special ritual sanctity; it was in use simply because it was near at hand. As time went on, and the little city grew year by year, new wells were sunk, water gathered from fresh springs, till at last the resources of even this marshy land were drained. Then came Peisistratos with an enterprise worthy of his fame. No surer road to popularity than by providing the city with a water-supply at once adequate and splendid. He built the aqueduct, he changed Kallirrhoe into Enneakrunos; it was possible now to plant the agora with plane-trees, and the whole city blossomed out afresh. The aspect of the fountain-house Peisistratos built may in main

outline be reconstructed from the many black-figured vases with scenes of water drawing; to one of these we drew attention in this relation in a recent issue. Probably in early Roman days this Enneakrunos underwent substantial alterations contemporaneous with the alterations that took place in the reservoir N already noted. In late Roman times the reservoir and Enneakrunos fell wholly into disuse, the agora had shifted to the north of the Areopagos, and there was no longer any need for a large water-supply at the gate of the citadel. The conduit was extended by pipes to the new Roman agora, and the marks of this extension can still be seen in the Pnyx rock; indeed, these marks were at first mistaken for traces of the original conduit. That the Enneakrunos was completely destroyed is clearly shown, of course, by the fact that fragments of its masonry were built into the late Roman house already discussed. But down to at least the days of Pausanias, and probably much later, the ancient spring Kallirrhoe was still in use for special sacred purposes—the marriage bath and the like—and its scanty waters were supplemented by an artificial conduit. Just such an arrangement is found at Delphi; the sacred well Castalia had but a scanty and intermittent indigenous water supply; that the faithful might not be disappointed, it was supplemented by an artificial conduit of less holy water.

The main arguments by which Dr. Dörpfeld supports his theory are two: first, what we may call the *natural probability of the site*; second, its *accordance with the narrative of Pausanias*. As regards the first, it is obviously more natural that the well of the primitive rock citadel should be close to the city gates. To fetch water for ordinary purposes from a Kallirrhoe on the Ilissus would have been almost impracticable; the distance does not perhaps look serious in a map, but let anyone try on a hot day bringing even a moderate-sized can of water from the Ilissus to the Propylaea, and he will probably be inclined to renounce on the spot the Enneakrunos episode. That there was a Kallirrhoe on the Ilissus in late days and that the Enneakrunos was put there by late lexicographers, no one doubts; but that was by a natural confusion when the city had shifted south, and the water supply, even of the Roman agora, was comparatively unimportant. Now as a native spring, a number of wells and an artificial conduit, together with fragments of a fountain, have come to light just in front of the citadel gate, unless there is strong reason to the contrary, it seems likely that these collectively represent Kallirrhoe Enneakrunos. The strong reason to the contrary is of course the passage of Thucydides, to which we shall presently return.

Second, the *accordance of the site with the narrative of Pausanias*. Pausanias, in his passage through the agora, has reached the Areopagos, and notes the Temple of Ares, which cannot, of course, be separated from the hill of the god. After several statues grouped near and about he passes to the Odeion, the Enneakrunos, the Temples of Demeter and Kore, and, further away, the Temple of Artemis Eukleia. Dr. Dörpfeld has not yet found the Odeion, he still hopes it will come to light, and with it the ancient orchestra, on the site of which this later Odeion was probably built. But it will be admitted on all hands that the site he chose for the Enneakrunos is just at the point which Pausanias would naturally have reached. Again, he has not found the Eleusinion, but if his theory be right it must be within the curve of the Panathenaic Way as it comes round to the left. Clement of Alexandria (Protrept., p. 13) speaks of the Eleusinion as *beneath* the Acropolis; unfortunately, he does not say in what direction. This, however, is made clear by Philostratos in his description of the Panathenaic procession. He says (Vit. Soph., II., i., 5) that the ship starting from the Feraerkes sailed up to the Eleusinion, and having made the circuit of it (καὶ περιβαλόνσαν αὐτὴν) passed

the Pelasgikon. The supporters of the "Enneakrunos Episode" have to take the ship right down to the Ilissus, a proceeding as unmeaning as inconvenient. The Eleusinion may yet be found, but a considerable portion of the probable site has been explored without results, and as the rock crops up very near to the surface, it is to be feared no traces will be found.

The question of the Enneakrunos is intimately bound up with the second important discovery—that of the *Dionyseion*. Here it will be remembered that the facts ascertained are that an ancient precinct of Dionysos has been discovered, and above it an assembly hall of the Iobachchoi, known to be such by a well-preserved inscription. That the ancient precinct belonged to Dionysos no one doubts, as, though no inscription of its date has come to light, the presence of the wine-press places the attribution beyond dispute. Further among the later sculptures and inscriptions there is, as has been seen, sufficient evidence that a Roman sanctuary of Artemis was at least near at hand.

Dr. Dörpfeld believes that in the ancient precincts he has found the Leneaion or Sanctuary of Dionysos *in Aἰναιῶν* (in the Marshes), the seat of the most primitive cult of Dionysos at Athens. The site of the Leneaion has been long disputed. The old orthodox view (based again on Thucydides) was that the Leneaion was somewhere near the present theatre, to the south of the Acropolis, and that the marshes in which it lay were in the district watered by the Ilissus. To this view, long ago, Dr. Dörpfeld took exception, on the ground that this site was not and could not be marshy—it is too thoroughly drained by the Ilissus; he did not, however, at once think of the west slope of the Acropolis, because till the excavations began its marshy character was not apparent, nor was it known to be the central point of a system of local springs as well as the great artificial conduit. Since the diggings took place it is sufficiently apparent that the water is caught and confined by the ridge of the Pnyx, as it meets the Areopagos, and that but for artificial drainage, the hollow between must of necessity be a marsh-land.

Dr. Dörpfeld's next point is the *argument from literary sources*. The temple *in Aἰναιῶν* we know to have been identical with the Leneaion. Hesychius (sub voc. *Aἰναιῶν*) tells us expressly that the Limnai was a place dedicated to Dionysos, at Athens, where the Leneaion was celebrated. It also bore the name Dionysion as we know from Isaeus (viii. 35). Dionysos Leneaion is the god of the wine-press, and the ancient precinct with its wine-press is admirably suited to his worship. Before the building of the great Dionysiac theatre festivals in honour of Dionysos went on in the ancient orchestra, which, according to one lexicographer (Tim. Lex. Plat.), stood near to the statues of Harmodios and Aristogeiton, and is, as we have seen, close to the Areopagos. This orchestra it is natural to bring into connexion with the Dionysiac precinct first discovered. Moreover, as Dr. Dörpfeld points out, the precinct is quite peculiar in character; it is carefully secluded from the main highway, and it contains no votive offerings. There was in Athens we know one ancient sanctuary of Dionysos which was opened but once in the year. In this took place the sacred marriage of the god with the wife of the archon Basileus, one of those primitive "sympathetic magic" ceremonies common to so many early peoples. In speaking of the oath taken by the Gerairai at this sacred marriage Demosthenes (c. Neairam, 76) says "they wrote it on a stone stele and set it up in the sanctuary of Dionysos by the side of the altar (*παρὰ τὸν βωμὸν*) in the marshes, and the stele still stands there to this day, with its indistinct letters of the Attic type as a record of what was enacted; and it was on this account that they set it up in the most ancient sanctuary of Dionysos, and also the most holy—i.e., that in the marshes—so that many people might not read what was

written, for it is opened only once a year—on the 12th day of Anthesterion." The actual hole in which this ancient stele was set above Dr. Dörpfeld thinks he has found on the altar-foundation already described (Fig. 1). In a sanctuary of this kind, so rarely seen, works of art would naturally be absent, and Dr. Dörpfeld, seeking as he did this particular sanctuary, boldly prophesied that none would come to light. It was essentially a "mystery" sanctuary, with no tincture of the museum.

It may be added that distinct traces (sculptures, inscriptions) of a Roman Artemision have come to light, and these are significant, not for their own sake, but because we know that in this same district of the Limnae there was a sanctuary of Artemis *in Aἰναιῶν* (Schol. Call. ad Dian. 172); this Dr. Dörpfeld believes he has found in the precinct surrounded by polygonal walls close to the Dionyseion.

So far, all seems to fit in admirably. Pausanias is manifestly on the side of Dr. Dörpfeld; but there remains the old crux of the passage of Thucydides. If Thucydides said, as he is supposed to have said, that the shrines he enumerated, i.e., that of Zeus Olympios the Python, the shrine of Ge, and that of Dionysos *in Aἰναιῶν*, lay to the south, clearly they cannot be excavated due west, or, still worse, north-west. We have given above a translation of the passage, but the original must be quoted (II, 15). *Τὸ δὲ πρὸ τοῦτον ἡ ἀκρόπολις ἡ νῦν αἶσα, πόλις ἦν, καὶ τὸ πρὸ αὐτῆς πρὸς νότον μέγα τετραμήνην τεκμήριον δὲ τὰ γὰρ τὰ ἐν αὐτῇ τῇ ἀκρόπολει . . . καὶ ἄλλων θεῶν ἔστι καὶ τὰ ἔξω πρὸς τοῦτο τὸ μέρος τῆς πόλεως πολλοὶ ἱερόναι*—then follows the enumeration of the shrines as above. *Πρὸς τοῦτο τὸ μέρος*, literally *towards this part*, has always been taken as meaning *towards the south*. This interpretation has been, if not caused, at least supported, by the fact that the familiar accredited sanctuaries of Dionysos and Zeus Olympios are to the south. Dr. Dörpfeld takes the passage quite otherwise; the gist of the whole passage, according to him, is not in which direction the old city and its shrines lay, but the fact that what later was called the Akropolis was then the whole *polis*, and the ancient shrines lay either within the *polis*, or, if *ἔξω*, i.e., outside the gates, close up to the *πόλις*. No better description could be found for the lie of the precinct that Dr. Dörpfeld calls that of Dionysos *in Aἰναιῶν*. It is *ἔξω*, but unmistakably *πρὸς τοῦτο τὸ μέρος*, lying close up to, creeping up the hill "towards the" citadel, the ancient *πόλις*. Now, that there was a Python and a sanctuary of Ge close to the temple of Zeus Olympios, to the south-east of the Acropolis, no one denies. We have it on the express testimony of Pausanias. But this Python could not by any stretch of controversy be called *ἀρχαῖον*. The old Python lay (and it was Dr. Dörpfeld who first placed it there) under the north-west corner of the Acropolis; it may therefore be said to have been *ἔξω*, and certainly *πρὸς τοῦτο τὸ μέρος*, close to the citadel. Ge presents no difficulty, as Pausanias saw her sanctuary just before he entered the Propylaea. But what of Zeus Olympios? Here one thing is plain: the sanctuary near the Ilissus could not be called "ancient"; but was there another, and can it be placed at the west end of the Acropolis? Strabo, speaking of Harma in Attica, says, "There the proverb took its rise, 'When the lightning has flashed through Harma.' The Pythiastai, as they were called, take note by the order of the oracle of any lightning that flashes when they are looking in the direction of Harma, and when they see it they dispatch the sacrifice to Delphi. They have to keep watch for three months, three days and nights in each month, at the altar of Zeus Astrapios, the sender of lightning. This altar is in the wall between the Python and the Olympieion." Now it is obvious that the Pythiastai could not have a much worse place for observation than the low-lying land of the

Ilissus, nor a much better than the north-west rock of the Acropolis, which looks direct to Harma.

Therefore, on this supposition, the ancient sanctuaries are all re-found complete, just in the order going downwards from the citadel in which Thucydides names them: the sanctuary of Zeus Olympios, the ancient Python, the shrine of Ge, the precinct of Dionysos, and "not far away" the Enneakrunos; so long as we can accept Dr. Dörpfeld's reading of the words *πρὸς τοῦτο τὸ μέρος*.

NOTES.

THAT success may attend the bold attempt to found an Architectural School at Liverpool under the wing of Victoria University cannot fail to be the wish of all who are interested in the progress of architecture or of architects in this kingdom. The especial boldness of the scheme lies in the provision of a course of education for architectural tyros prior to their entry into an office, which is, as far as we know, the first attempt in England to place architectural education in a line with the system universally adopted on the Continent and in America. Of the advantage to the student in this method there can be no question, as he receives, just at the period of his greatest ignorance, the maximum of individual attention and regular systematic instruction. The value of a trained pupil to his future master is also, without a doubt, far beyond that of a raw, inexperienced youth, fresh from school. No one who has conscientiously endeavoured to help on a new pupil in his office would hesitate to prefer one who had received a couple of years' steady tuition in such a school as that now started in Liverpool. Indeed, it would be an excellent investment for any Liverpool architect to pay the fees of his pupils, and send them to the school for the first two years of their articles. The saving of his own time and of spoil work, and the increased value of his pupils' services for the remainder of their term would amply recoup him for the expenditure of the school fees. On another aspect the outlook for the Liverpool School is one of happy augury for the art of architecture. The composition of the staff, with Mr. F. M. Simpson for director, Mr. Charles J. Allen, Mr. R. Anning Bell, and Mr. J. Platt, is a guarantee that an earnest endeavour will be made to institute and maintain a close connexion in the training of architectural students with what are popularly termed "the allied arts," and may rather be expressed as the comprehension of art, as a whole, of which architecture is but one part or form of expression. The student-architect is intended to learn something of the methods, the capabilities, and the limitations of sculpture, painting, modelling, decorative painting, wrought-iron work, and wood-carving. The course of instruction is arranged to occupy two years, during the first of which the student is instructed in freehand drawing and modelling, geometrical drawing and perspective, history of architecture, buildings, materials, and construction, and elementary mechanics. The fee for the complete course is 25l. for the session of three terms, and this admits the student to all lectures by the Professor of Architecture or his Demonstrator, to the architectural studio whenever open (from 10 a.m. to 4 p.m. every weekday, except Saturday, and from 7 to 9 p.m. on four evenings of the week), to the lectures by the other Professors, and to all the classes in the Applied Art Section for which they have time. Provision is also made for students already in offices, who are unable to give more than a part of their time to the course, by the establishment of afternoon and evening lectures and instruction both in the architectural studio and in the crafts school.

THE meeting of the British Association next week at Ipswich hardly promises to be one of the most brilliant in the annals

the Association. Ipswich is a smaller one than the Association has usually selected for its meetings; and though it is still smaller one when the Association met there forty-four years ago, it was reported on that occasion by an exceptionally brilliant collection of eminent men of science, with a very eminent one as President. Among the speakers to be read on subjects in which they are specially interested is one by Professor Henrici on "The Teaching of Technical Drawing in Schools"; not, we assume, in Board Schools, which are overgrown already, and where the teaching of general drawing is as much as can well be afforded for, and would be far more in place. The section of Mechanical Science is to be presided over by Professor Vernon Harcourt, whose Presidential address will no doubt be of great attention. Light Railways and Rivers will be among the subjects treated of in this section, both of which are of practical interest to the country in a broad sense. As usual, a good many excursions are arranged, including Bury St. Edmund's, Colchester, Cambridge, Great Yarmouth, and Cromer.

CONSIDERABLE space is devoted in the last number of *Construction* to an article by M. Planat in regard to communication from the town of Nancy for the suppression of "Universal Exhibitions" in Paris, urging that the coming exhibition must, at all events, be the last; the country is getting disgusted with them, and that the tendency of such exhibitions is to denaturalise Paris as a centre of intellectual and artistic life, and make it a show place. This argument is evidently shared by some of the Parisians as they of serious attention. Another chief, to which M. Planat alludes in his article, is the permanent alteration of many localities in Paris which have great historical interest, and which are deprived of this for the sake of a temporary exhibition; the exhibition buildings are cleared away in one place, but the old Paris sites and streets which they have obliterated can never be recovered. We are not surprised at such a feeling of remorse being struck, but to be thinking the mischief lies mainly in the frequenting of such exhibitions too often. At considerable intervals of time they are official and interesting; repeated too often they become a nuisance, and their character is lowered in the restless endeavour to render each exhibition more attractive than the last. Shall we say more startling? than its predecessor. The 1889 Paris Exhibition certainly of great interest, but if there is any idea of having one in 1900, the one should not have been held; the two are far too close together. The 1900 exhibition is now a settled thing. After that, it is hoped the French Government and the English people alike will have the good sense to see that such exhibitions are only valuable in that they represent the collective work and progress of a generation. The world could well do with a Paris Universal exhibition once in a quarter of a century; but it is enough, if the thing is to be really done, and of the highest class.

THE questions which have recently been addressed in the House of Commons by the President of the Board of Trade in regard to the ventilation of the underground railways, may have some indirect effect on two railway companies of London chiefly interested in the underground system. It is that the Board of Trade has no authority by means of which it can at present enforce good ventilation. It is by no means clear, however, that unless these companies endeavour to improve the present state of affairs, some legislation may not take place. The Board of Trade have now the power to insist that the permanent way of a railway is in fit condition before it is used. Most railways are used above ground; but where

a railway runs underground, it would seem that the Board of Trade ought to have the power to insist on a wholesome system of ventilation. Good air is something more than a mere convenience to passengers; it is a necessity. The public are not asking for an impossibility, as was shown by Mr. Keith, C.E., in his letter to the *Times* last week. This gentleman recently reported on the ventilation of the House of Commons, and he says in the plainest language that "there is no reason in the world, even with the present steam-traction arrangement, why it should not be the best ventilated railway of its kind anywhere, viz., the coolest in summer and the warmest in winter, with the atmosphere invariably fresh." We hope that some among the many new, and we trust energetic, Members of Parliament, will not allow this matter to drop.

NO Minister could afford to make light of the important deputation on the subject of the East London water supply which waited on the President of the Local Government Board at the end of last week. The deputation asked that the Board should institute an official inquiry into the cause of the recent water famine, and Mr. Chaplin promised to give the matter a careful and candid consideration. It appears that the water company base their defence for the short supply, in the first place, on the drought. But, after all, this summer cannot be regarded as anything of so extraordinary a nature as to make this defence a sound one, for a water company should take dry summers into consideration, and be prepared to cope with difficulties. The second and third defences are insufficient storage, said to be caused, as regards the first, by the action of Parliament in 1893, and breakage of consumers' pipes. We can scarcely think the water company can substantiate this defence. But inquiry or no inquiry, this recent deficiency of the supply of water to the East End is a strong argument in favour of one central public authority, whose primary object shall be to supply the public as efficiently as possible, not to take care of the shareholders' pockets. Probably the real secret of this recent breakdown is the conflict between the interests of a body of private shareholders and those of the public. The continuance of the supply of water to London through the agency of limited companies, whose first object is the giving of dividends to shareholders rather than of pure and abundant water to householders, is an anomaly which must be ended.

THE recent questions in the House of Commons as to the sanitary condition of Aldershot have elicited very unsatisfactory information from the responsible officials. It is admitted that there have been a number of cases of diphtheria, and a very large number of sore throats. All that the officials can say as to these diseases is that it is thought that they have arisen from the opening of old drains for the purpose of alterations and improvements. It is obvious that if the opening of old drains is the cause of these attacks, that the state of the drains is a disgrace to the nation. But, in truth, one of the most striking anomalies of the present day is the fact that whilst the Local Government Board is doing very good work in obtaining better sanitation in private buildings, edifices which are under the control of Government departments are in a worse sanitary condition than ordinary private buildings. It is not long ago that it was admitted that the sanitary condition of the barracks at Windsor was very bad. Dublin has long been a by-word in military circles, and we make bold to say that an impartial inquiry would probably result in the condemnation of most of the barracks in England, from a sanitary point of view. We hope that this question will not be allowed to rest, and that the illnesses at Aldershot will be traced to their source.

WE understand that the arrangements made by Mr. Lionel Cust, the newly-appointed Director, for transferring our National Portrait Collection from Bethnal Green Museum to Trafalgar-square will shortly be completed. This collection, its nucleus being the Chandos portrait of Shakespeare, was first opened to the public in 1859, in a house in Great George-street, Westminster, having been established three years previously by the State, with a subsidy of 2,000*l.*, upon a resolution moved by Lord Stanhope. After about ten years the collection had so greatly increased that, pending the provision of more suitable quarters, it was transferred to some of the wooden galleries of the Exhibition buildings (1862) at South Kensington, overlooking the late Gardens of the Royal Horticultural Society. Those galleries were by no means adapted for the proper custody of so valuable a collection, whose safety was at length placed in jeopardy by a fire which broke out in an adjoining structure. So in 1885-6 the pictures, busts, autographs, and other exhibits were taken to the Museum buildings at Bethnal Green. For the new galleries Mr. Alexander munificently offered 60,000*l.*, a gift which he subsequently increased with a further sum of 20,000*l.*, in order to efficiently carry out Ewan Christian's designs, the Government voting 16,000*l.*, which, we believe, has been devoted to the connecting wing at the north-east end of the National Gallery. The contractors were Messrs. Shillitoe & Sons, of Bury St. Edmund's. For clearing the ground at the end of Charing Cross-road were pulled down Hemming's-row, formerly known as Dirty-lane, built in 1680, the old parish workhouse, and some houses at the south end of Castle-street. The London County Council conveyed to the Crown for 7,000*l.* a plot of land abutting on Hemming's-row, throwing 900 square feet into Charing Cross-road, the Crown, at the same time, agreeing to throw an area of 575 square feet of its own land into that thoroughfare (1889).

THE new memorial church to the late Emperor William, which was inaugurated on Sunday last, is from the designs of "Baurath" Schwaechten, and occupies a conspicuous position in the Grunewald-avenue to the west of Berlin. The site is an isolated one, and a number of important roads cross the avenue at the point where the new church has been erected, so that an open space had to be formed around the site to allow for the traffic. The site is now practically an irregular "square" of about 500 ft. in every direction. Herr Schwaechten obtained the commission after a competition, in which his plans had been premiated. The foundation stone was laid early in 1891, and the work has really only been in the hands of the builder for four years. The result is that, though officially "open," the new place of worship is far from complete, especially in the interior, and that several years must elapse before the workmen finally move out of the building. The design is based on the "Romanesque" churches of the Rhine, and the result is that the building is a somewhat clumsy pile, which would not find much favour in this country. In plan the design is only remarkable on account of the spacious porch, which serves as a memorial hall, and over which a high tower has been erected. This tower is about 350 ft. high, and is surmounted by a heavy Imperial crown. There is seating accommodation in the church for 2,000, and much money has been expended on the organ, the clock, and a fine peal of bells. The total expenditure will be 3,200,000 marks, or about 160,000*l.*

A REPORT to the Local Government Board by Mr. Evan Evans, on an outbreak of diphtheria at Holbeach, gives the conclusion that the illness was communicated from other places, and was not directly due to the insanitary state of Holbeach; but at the same time records a state of

things at Holbeach which must leave it a fertile field for the propagation of infection. It appears from the report that there is a great deal of overcrowding in Holbeach; that the sewage is run into dry wells which are not steined, and that except for a few water-closets in the better class residences, excrement is almost everywhere disposed of in privy vaults and privy pits sunk at varying depths, all which receptacles allow of leakage, while their contents are only emptied at long intervals. There is want of sufficient and suitable privy accommodation for many of the smaller cottages, and complaints were made as to nuisances arising from the percolation of excreta from privies immediately adjacent to washhouses, food-stores, and living-rooms. The water-supply is partly derived from rain-water collected off roofs, and stored in underground circular brick tanks, and partly from shallow wells, 6 to 12 ft. deep. The wells are merely dry-steined, and, from their proximity to cesspools and privies, but few are beyond the reach of contamination. All the public wells, with two exceptions, have been so much fouled by emanations from the gas-mains as to be unfit for household use, and for similar reason the supply of many private wells is compromised. Many cottages are without a water supply, and their inmates have to beg water of their neighbours. The Medical Officer of Health has repeatedly drawn the attention of the Authority to the polluted water-supply, and to the various nuisances prevalent in the district, but without effect. It is to be hoped that the Local Government Board will bring some pressure to bear on the so-called "Authority" which thus neglects its obvious duties.

IN the curriculum of the Architectural Association we notice some new and important features. In the first place, the Committee has recognised the existence of two distinct types of architectural students, the man who wishes to pass the Institute examinations and qualify for membership of the corporate body, and the man who intends to ignore the Institute and aim at the Academy and Fine Art. For both of these provision is now made. For the former by bringing the recent curriculum more into line with the Royal Institute of British Architects' examinations and definitely basing the instruction on the requirements of those examinations. For the latter by the revival of the former Classes of Design, on the voluntary system, which were one of the oldest and most successful of all the institutions of the Architectural Association. The examination course is now arranged so that a student may, if he so desires, attend all the lectures in preparation for either the Intermediate or the Final examination in one session. This will especially meet the needs of numerous young men who come up to London from the provinces for a time to complete their preparation for an examination. By coming to London at the beginning of October they can go through their course at the Architectural Association and sit for their examination in the following June or July fully prepared. Provision is also made for those who desire to spend a longer time over their preparation or to work through a studio course as well. The other class of student will work in the School of Design and Handicraft, uniting the study of design with the study of handicraft in various technical schools, so that he may comprehend the meaning of what he designs and the capabilities of the material in which he is working. His designs are then to be criticised by the Visitors, the list of whom includes some of the very best of our present-day architects.

TESTS OF FIREPROOF MATERIALS, NEW YORK.—A committee of architects, engineers and representatives of insurance companies in New York has arranged to make an extensive series of test of fireproofing materials, on a scale comparable with the conditions which exist in the case of fires in actual buildings. It is intended to try the effect of water as well as fire.

LETTER FROM PARIS.

It appears that a serious difference has arisen between the Department of Fine Arts and the Municipality of Avignon. The latter, intensely ignorant, and seemingly manifesting the most absolute contempt for the archaeological riches of this interesting town, has almost unanimously voted the demolition of the celebrated ramparts that form around the ancient Papal city a picturesque entourage so perfectly restored by Viollet-le-Duc. Naturally, this act of vandalism has excited an universal outcry, and the whole Parisian press has denounced with indignation the stupid decision of the Avignon bourgeois, which, let us hope, will never be carried into execution. Indeed, for that the acquiescence of the Government would be required. For the ramparts of Avignon, just as much as the palace of the Popes, the arch at Orange, the theatre of Arles, or the citadel of Carcassonne are carefully-preserved historic monuments with which an imbecile Municipality may not meddle. The Minister of Fine Arts will know how to save them, and they will remain, as heretofore, one of the curiosities of Provence.

Although we are here discussing a question *extra muros*, it is somewhat curious that we should have to point out the carelessness and ignorance of certain provincial Municipalities with respect to historic monuments which would have disappeared if the press of Paris, and the artists of the capital, had not taken up their defence and saved them from total destruction.

It is announced that the Mairie of the Xth Arrondissement, which has already been referred to in the *Builder*, will be ready for inauguration on February 24 next, under the auspices of M. Félix Faure, President of the Republic, who was born in that Arrondissement. We have already said that this Mairie, Renaissance in style, does great honour to its architect, M. Rouyer. It is situated in the Rue Faubourg St. Martin, and occupies an area of 2,200 superficial metres. The cost of erection amounts to 2,200,000 franc. It is likewise announced that the monument to Emile Augier on the Place de l'Odéon will be immediately commenced. It will consist of a granite stele, adorned by two female figures, symbolising the principal works of the poet, and by a statue of a child personifying the genius of Comedy. Raised above will be the bust of Emile Augier. It is believed that this monument will be ready for unveiling at the end of the month of October. In the following month of November, the inauguration will take place of the monument, erected by subscription, to the memory of the military painter Charlet. This monument, the work of the sculptor Alexandre Charpentier, will be erected in the centre of the square of the Place Denfert Rochereau. It will consist of a stele bearing, on a medallion, the effigy of the painter. At the foot of the monument, two figures will recall two types often represented by Charlet, a Grenadier of the Imperial Guard and a "Gamin de Paris."

We may mention, in this connexion, that a Committee has just been formed to erect in Paris a monument to the memory of the poets André Chenier and Roucher, both of whom died on the scaffold in 1793, victims of the Reign of Terror.

The avenue called "des Reines," which surrounds, in the form of a semi-circle, the garden of the Luxembourg will be shortly completed by the statue of Margaret of Anjou, the work of the sculptor Taluet, which will occupy the place left vacant by the "Velleda" of Mairin, which it has been thought well to place in the new square of the Tuileries. This Velleda, which formerly adorned the ancient *apartment* of the Luxembourg, had acquired a reputation entirely fictitious, for it is a figure with little decorative value, utterly banal and defective in execution. The State, which purchases every year numerous works from the sculpture galleries, might without any regret have left the Velleda in the store-house and found a more modern statue for the decoration of a garden which contains such remarkable works as the "Quand-même" of M. Mercier, and the "Exiles" of M. Mathurin Moreau, a photograph of which has already been published in the *Builder*.

It appears that the French Government intends asking from the Belgian Government for the removal to Paris of the remains of the celebrated painter Louis David, who died an exile in 1829, and was buried at Brussels. Pending this solemnity, the Minister of Fine Arts has instructed M. Emile Soldi to execute a marble bust of David, which will find a place in the galleries of the Palace of the Institute.

Strenuous endeavours are being made at the Palais des Beaux-Arts, in the Champ de Mars, to

organise the International Exhibition of the centenary of lithography. This exhibition, which will open its doors on September 19 next, I already said to be most interesting. It will comprise a retrospective section and a modern section. Moreover, the public will be able to see at work, in the Avenue Rapp, the machineries employed in commercial lithography and the printing of the large coloured posters, which thanks to the painters Chéret and Hugo d'Ales have, during recent years, made so great progress. The committee of this forthcoming exhibition has for honorary presidents MM. Puvion de Chavanne and Detaille. MM. George Duplessis and Benjamin Constant, Members of the Institute, preside over the two sub-committees entrusted with the reception and classification of ancient and modern examples.

We are pleased to announce that the Museum of the Louvre continues to increase each year thanks to the intelligent energy of M. Kaempfer. Thus it is that the galleries of modern French sculpture, which are situated in the north-west angle of the square court, are about to be enlarged by the addition of two rooms intended to contain amongst other acquisitions, the casts presented to the State by the widow of the sculptor Carpeaux. Likewise in the ancient *Salle du Manège*, situated under the grand gallery of French paintings of the seventeenth century, is about to be installed the collection of casts and reproductions of celebrated works in foreign museums. It is hoped that it may be possible to open these new rooms to the public at the beginning of next spring.

On the left bank of the Seine, between the Champ de Mars and the esplanade of the Tuileries, work is actively proceeding with the future line called "des Invades," which will ultimately be extended to Cluny. As soon as the Esplanade Station is completed, the State will proceed with the Montparnasse Station, which has become notoriously inadequate, and will transform it into a veritable modern station with direct access to the Boulevard Montparnasse by grand staircases, which will connect the departure and arrival platforms with a great waiting-hall, communicating directly with the Place de Rennes. Thus transformed, the Gare d'Orléans on the left bank will become one of the terminal points of the State lines, which comprise an extension of about 2,000 kilometres, and this latter will become, on the completion of the works, the property of the suburb of Versailles of the left bank. All these important works, proceeding concurrently with those at the Gare d'Orléans and the Gare de Paris, Lyon, Méditerranée will be completely finished for the Exhibition of 1900.

At the École des Beaux-Arts, where the death of M. Ancelet has caused a vacancy in the Chair of the Professor of Ornamental Design, seven competitions have just been decided. In the competition in construction second class medals have been awarded only to MM. Froucat and Brune, pupils of MM. Moyaux and Pascal. In the competition of the second architectural class of ninety-four designs submitted, the jury has reported that honourable mention of the first class has been obtained by MM. Leenhardt, Vansier, and Hormbaste. Lastly, in the competition for detail, for which the subject was "Loggia," the jury has awarded only second class honourable mention to twenty-nine competitors which is not a result worthy of praise.

On Friday last week there was buried in the cemetery of Pecq (Seine-et-Oise) the architect Varcollier, who died at Paris on August 27 after a long and distressing illness. Marcellin Varcollier, son of a former official of the Préfecture de la Seine, was sixty-six years of age. Formerly a pupil of the École des Beaux-Arts, he was honorary architect of the town of Paris and member of its architectural council. Amongst his principal works we may mention the synagogue in the Rue des Tournelles, erected about eighteen years ago, and amongst later works, the new Mairie of the XVIIIth Arrondissement, opened about three years ago. M. Varcollier leaves several children and one of his sons, a rising young architect, connected, under the direction of M. Bouvard with the works of the future Universal Exhibition.

The death is also announced of M. Jean Garnier, a talented sculptor in metal. One of his works, "L'Enfer des Luxurieux" of Dante, is in the Museum of the Luxembourg. This clever artist, who gathered successful inspiration from the Renaissance Masters, made the grave mistake at one time of abandoning art for politics, and during the sad days of the Commune he was appointed Keeper of the Dies at the Mint, under the direction of "Citizen Camelinat."

DOMESTIC METAL-WORK.*

BY HARRY SIRR.

AM hardly surprised that in the abundance of intense enthusiasm displayed in study and research which led to and had for its full result the production of that remarkable Renaissance of the dark times—the Gothic revival—much of the work of our more immediate ancestors which had largely enhanced their domestic surroundings was brought to light. I now more particularly call to mind such metal accessories as furniture, either fixed—as in the case of door-locks and escutcheons—or portable utensils, such as candlesticks and fireplace adjuncts. In England alone there is quite a wealth of such remaining, and it is to study of these I would particularly direct some attention.

It is undeniable that to a very great extent the use of a good architectural interior may be enhanced by meagre and worthless furnishing; but, on the other hand, with due care a mediocre dwelling can be rendered interesting and unpretentious by the introduction of simply designed and well-made essentials, whether they be fixtures, fittings, or furniture, and of whatever material they are made; for there is no reason for the consideration of convenience, which is of amount importance, should be incompatible with rendering objects of daily use pleasing to the eye. This is why I think it may be interesting to you if I touch upon some such things which have claimed my attention. Perhaps they may not all of them be such as will succeed in claiming the interest of the public, and they certainly receive but a poor return of it from the general public; but the only of the latter are not interested observers, but they are educated judges, as we know by experience. Take them for example in the selection of grates. How frequently a client sustains a perverse preference for the vulgar and ill-designed grates offered by some ultra-commercial house; the effect at times upon the happy results which always possible in the choice of such articles as the display of good taste, but I am well aware of difficulties which would at once crop up if I attempted to define salient essentials to its selection. I will but venture to hazard the remark that to a great extent I believe good taste is inherent, although susceptible to regulation and improvement, while it can also be largely aided by acquaintance and familiarity with knowledge of good art, and with this fortunate lot, that sometimes, at any rate, an individual is led to seek good expert advice, and to be guided thereby.

cannot in this paper do more than glance at it: at small patches of the vast field which it covers, and it would be difficult, therefore, to attempt the consideration of any of the objects which refer to in chronological order—indeed, it would be exceedingly laborious to forge a catena of evidence sufficiently strong, and I think no end could be served, so far as we are concerned in this. In most work some characteristic helps the date with fair accuracy, and it is very satisfactory to be able to note this, but an abundance of archeological zeal while dealing with the design and workmanship will hardly fit us, although we must all feel the additional zest in works which are old—the relics of our fathers, and especially when of historical importance.

In her "Essay upon Needlework" the Countess of Arundel has said—"From the stateliest denizen of the proudest palace to the humblest dweller in the poorest cottage, all more or less rely upon the needle, and need its practical services." How true this is! And yet not one whit less is the scope or the practical services rendered by the metal-worker.

Our ethnological studies soon show the intimate connection of metal-work with the history of man, tradition and relics attest to the Ancients' veneration of it. When we get to modern times, comment is unnecessary. I exempt work of precious metals because the goldsmiths' and silversmiths' art are quite separate subjects. I am concerned only to strongly maintain that the opening for domestic purposes of the metallic elements—iron, copper, and lead, and the round bodies of steel and brass, are works of art in this day—quite apart from their use for engineering uses—still claim to deserve æsthetic consideration and handling as part of the designer and craftsman. In the time when real civilisation and progress were to be associated with warfare, when we abandoned great embellishment on our

weapons and firearms, we cannot afford to forget the domestic life of our nation which *must* receive attention. The advance of education, the better knowledge of sanitary laws, and increased freedom, are not likely to fail in promoting the comfort of the community at large; but it is highly doubtful whether their education will in general lead the majority to supplement their appreciation of beautiful surroundings in nature, with a ready discernment and perception of that which is vulgar and tawdry in human handicrafts, unless the refining influence of art is brought to bear upon them in things large and small; and, if it is desirable they should become educated in this respect—for it is an important part of culture—it is necessary that their houses and home surroundings should be well designed in addition to being rendered wholesome. How one yearns for the time when the public will demand houses which manifest refinement!

It is now, when he is being encouraged in so many ways, that we must do our part to restore the lost prestige of the workman or craftsman, not only by impressing him with the fact of the giant share which he has in the Arts of Peace, but by persistently specifying well-designed and well-made goods, and thus create an increasing demand for such, which will give encouragement and help to all concerned in their production. In a truly utilitarian age, when people seem to become altogether callous of beauty in an absorption in mechanism and machinery, if we can do this much, who can say but that in the future we may largely aid to reclaim our manufactured goods from the ugliness, vulgarity, and senseless ornamentation which characterises so many of them? I quite well see there are improvements going on, but I do not believe in stopping short in our crusade, even for the space of a moment. The mere contemplation of it all is a pastime only—soothing, no doubt, but our good intentions should be manifested by the carrying out of such real work for the cause as is within our reach.

And now I will ask you to bear with me while I take a rather long jump down the Ages, and glance at some of the productions of ancient times to see what we find to admire in the shape of metal-work of a domestic character. I cannot, of course, refer to the ancient times without mentioning those beautiful objects, the Greek and Roman lamps. Lamps were common enough in Rome—Pliny refers to them; and hundreds were exhumed from the buried Vesuvian cities. Many are dolphin-like in form, some have their ends worked up into the form of a shell, and others are embellished with animal forms. I call to mind a specimen in the British Museum ornamented with lions' heads and satyr masks. The usual support was an independent candelabra. Much ingenuity was exercised by both Greeks and Romans in the construction and ornamentation of these supports, which combine lightness and elegance. The shafts are ornamented with twining ivy and the graceful acanthus, or they have perfectly plain stems—sometimes fluted; and frequently the stems represent the throwing out of buds, or they are in the likeness of a reed or cane. What is noteworthy is the general striking resemblance of all the examples, while the details of the ornaments are of infinite variety, and the profusion of the latter is remarkable in the elaborate examples. This kind of support was either surmounted by a socket to receive a wax candle, or a disc for a lamp to stand upon. The base was generally a low tripod of lions' feet or griffins' claws.

Those which are found at Pompeii or Herculaneum are not only remarkable for the beauty of workmanship, but also on account of the whimsical variety of their designs. There is an instance of one which is of very ingenious construction, so made that it can be taken to pieces for convenience of transport.

I call to mind, also, an Etruscan tripod candelabrum which is in the British Museum, of much beauty and fine workmanship, supporting a figure as a stem with a socket on the head. In passing I may mention the curious disc-like members round the stems of some ancient candelabra, like pippins strung on—the very reverse of the characteristic saucer treatment of Italian ones in brass which were copied by the Dutch.

This ancient work is in bronze of fine quality, and so renowned were the Etruscans for their works of bronze that they spread over the whole land and sea.

Then again, in the British Museum, there is an especially fine tripod from Herculaneum, and another which is ornamented with panthers' heads. I must also call attention to the fine bisellium and lantern, the former bequeathed to

the nation by Sir Wm. Hamilton and the latter by Sir Wm. Temple; also to the many beautiful inscribed tablets, and the keys, which, in the antique, are often elaborate with ornate bows. There is even a padlock from Pompeii, somewhat like a snail in shape, and so one could continue calling to mind objects which illustrate the Ancients' great skill and exquisite taste. Most of these objects are, no doubt, from rich houses, many are from public buildings, but there is sufficient evidence in the simpler things to convince us of the care bestowed by them upon ordinary work.

I have gathered from what I have read of Pompeii that, as a rule, their doors turned on pivots, and they were secured by one or two large bolts. When hinges were used they do not appear to have been ornamental, but some of the external door-handles are very handsomely wrought. Although these people excelled in their ornamental work, the locksmiths do not appear to have been remarkably dexterous.

I have referred to the prevailing use of bronze among the Ancients, but it was discovered in Pompeii that iron and lead also had been employed for the same purposes for which we now use them, and, contrary to what has been found to have been the practice among all other ancients, iron, and *not* bronze, was the metal most freely employed.

It is astonishing that we so seldom use bronze now when opportunities arise, for it is wonderfully enduring, can be cast and chased with the finest finish, and takes gilding as well if not better than any other metal. I know of one instance only which has come under my notice of its employment by an architect latterly, and in this case some ornamental gate panels, and brackets for marble shelves were cast in this metal and chased.

I feel it to be important to study the ancient metal-work, and I never tire of recommending a careful examination of the examples we happily possess. There are no other works so well worthy to serve as models in regard to their beautiful proportions, perfection of elegant design, and exquisite delicacy of workmanship.

It is true some of them are elaborate, but so much is gathered in and learnt by knowing them that it becomes easier and easier to discern and appreciate good work, and to discriminate with a true critical judgment; and this is of the highest importance to an architect.

When we come to deal with our own country, if we start with the Conquest, articles of furniture were coarse and few. Iron then came from the shores of the Baltic, but its use was principally for agricultural purposes, and little was imported beyond the bare necessities of life. From 1200 to 1500, when important changes were taking place in the condition of the people, there were the great fairs. Flemish merchants no doubt besides cloths brought metal, and the traders of the Hanse Towns iron and copper for farmers. Bruges and Antwerp sent household furniture, metallic and other necessities of all sorts; and the annual visits of the Venetian fleet must have been a great stimulus to the acquisition of useful and decorative articles. And so up to the fifteenth century, when our large mineral wealth of iron was hardly touched, and England supplied nearly all Western Europe with tin and lead. But with this growing interchange, and travel of our merchants abroad, we began to think about and to seek greater and more advanced comforts in our houses, and although many articles we now look upon as necessities were then really luxuries, and it was consequently only in the power of the great and wealthy to acquire them, yet gradually a vast change took place, till, in the Elizabethan era, and from then onwards, we developed rapidly in the matter of our domestic comforts. As an example of this, up to the Middle Ages the use of candles had been chiefly confined to churches, monasteries, and the houses of the nobility; but in the fifteenth century their use became very general, and at that time the trade of making them had assumed so much importance that the chandlers of London acquired an Act of Incorporation, and from this we can see that candlesticks had become necessary.

It is therefore quite understandable how it should have transpired that during the Gothic (chiefly an ecclesiastical) revival, little was or could be done in gaining much from the domestic work of the Middle Ages in England. The Medieval iron locks, hinges, &c., had become superseded except for churches and buildings which partook generally of an ecclesiastical character, and the finest old examples we have are chiefly met with in churches and large buildings. At all events the metal-work of our

immediate ancestors was overlooked for a time, and there was a huge gap with little or no progress in design—domestic metal-work suffering not the least from this neglect—indeed, its character commenced to deteriorate.

Brass had been made in Germany for many centuries, but its manufacture was not introduced into England till 1649, and from another authority I find no commercial brass was here till 1721 (as the metal termed "Latten" was very differently made). I cannot account for the disparity in dates. But for our purpose either is sufficiently significant. Brass goods, I presume, were made in England before, but no doubt the manufacture of brass in our country led to a greatly increased demand for goods in that compound metal. It appears pretty evident there was no domestic brass for the revival architects to study.

Pray do not suppose that I plead for elaborate and consequently comparatively expensive work in humble dwellings. This is not my view, for not only would it be out of place, but it would be altogether injudicious for an architect to saddle his client with an excessive outlay on the metal-work, just as much as it would on work of any other description. What I do plead for is simplicity itself, and yet with cast work the first cost is so little that I certainly think at times some legitimate ornamentation should be obtained, and at all times pleasing appearance in line and contour.

The register grates are now becoming antiquated, but I refer to them because the kind of ornamentation generally found upon them well illustrates the sort of meaningless work which was turned out plentifully some years ago. Who were the designers then? Can it be that the demand for these goods was so great, and the hurry so tremendous, that the qualifications of designers were never once inquired into? or were capable designers purposely ignored? Again, take cast-iron fenders, and look at some of the grotesques at ornamentation! I cannot think where the ideas originated. Some of the cheap fenders of the present day, made up of steel hollow bars and cast-iron, are perfectly wretched in design, and the ornament is utterly bad.

I recently came across a really good cast-iron fender front. It was not pierced at all, and therefore from the point of view of comfort, it might be regarded as a retarder of radiation, but as regards its treatment—for a simple piece of cast-iron it was perfect. As I remarked, it was merely a front, curved on plan. The decoration consisted of a groundwork of reedings or flutings in diagonal directions from a lozenge centre, upon which there was a small sprig in relief, and the extremities were treated with a groundwork of vertical close beadings. The top and bottom were emphasised with a few small shallow mouldings, generally beads, with a plain surface between them and the groundworks. All this is appropriate, simple, and effective, for when such work is dressed as intended, with black lead and polished, the effect due to the play of light upon it is extremely pleasing. I have frequently observed the effect of similar work ruined by the thickness and dullness of the japanning coat which has been applied, a great saving of labour I freely admit—so was Nubian blacking for boot leather, which fascinated the town one winter, but people found that out and gave it the cold shoulder.

I think I am not wide of the mark if I say that without doubt the best goods of this kind we find are generally the simplest, and the most free from redundant and undecorative ornament.

I will now ask you to further bear with me while I refer to some good work which has been done in the way of grates. Some of the best that we have come to us from the times of Queen Anne and her immediate successors. In many of these we meet with little wrought-iron columns as standards, finished with terminals, often of brass, vase-shaped, with curved or serpentine-shaped brass or steel face-pieces or frets below the bars. At times we find the bars of steel, with fret and standards of brass, and at other times the pierced fret is curved forward in a dipteral manner towards detached standards, as in eighteenth-century examples. How decorative the treatment is! and yet I know we cannot now do the same with Teales' grates, and I am aware that we have many good modern designs; but for all that, there is still much to be learnt from the study of these old grates in the way of the treatment of metal, and the fine effect obtained by silhouette. Adams devoted some of his attention to hob-grates, and his designs are very fine; and even nowadays there are rooms in which we can tolerate them, although not strictly orthodox in regard to the height of the fire-grate above the hearth, and notwithstanding the fact that they

are often delivered over to the mercy of the "house-wrecker."

We have plenty of examples of old fenders, and the brass ones seem to be favourites at the present time. They illustrate admirably the beauties of pierced work, either with or without embossing and the value of silhouette. Some of them give a healthy lesson when they exhibit their weakness by buckling, due to a lack of lateral stiffness under the pressure of feet. Although it is not good treatment to put feet upon a fender, undoubtedly it should be stiff and free of liability to buckle. These old fenders are often too high for modern ideas. I speak as I find. Their design, however, is generally admirable, and much is to be learnt from them.

In old brass fire implements we get delightful and elegant shaping, and the moulded work of the handles, and of the knobs upon them, and the old fire-rests is perfect. Again, I must make myself quite clear. I am not desirous that people should be burdened with brasswork to keep clean. That rests with themselves. I believe with brass fire-implements the trouble is really not so great. A periodical general clean and a rub with leather at intervals are quite sufficient. Steel implements should be kept bright, and yet often people who keep their steel very badly in this respect complain of the trouble of brasswork. The satiny polish which brasswork gets is due to the rubbing, with the further result that the work seems to improve with age; and this is why I am disinclined to favour the wholesale lacquering which is now so prevalent, concealing, too, as it often does, bad metal. I wish I could enter into the subject of the steelwork, but I do not feel able to do so this evening.

I am not aware that in our museums in England there have been yet collected to any great extent examples of domestic metal-work. Lady Neville Loan Collection at the South Kensington Museum is extremely interesting, and shows what might be done by trustees and authorities. There are some other examples, belonging to the nation, at South Kensington, but they are chiefly Flemish. It is a very great pity that our own work is so poorly represented.

There are some fine specimens in the local museum at Bruges of all kinds of brass fittings, fireplace adjuncts, and domestic utensils; and also in the Plantin and Sten Museum at Antwerp. At Bruges, too, there are some good specimens of old shutter and other hinges and latches in tinned iron, and some choice domestic furniture.

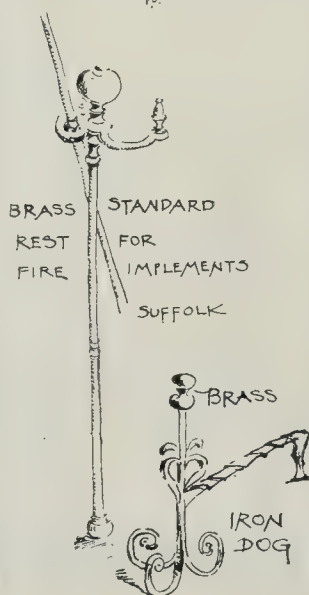
In the South Kensington Museum we have a valuable collection of locks. There are some old brass saucepans in the British Museum—one with the handle inscribed "Loyal to his Majesty," another with the couplet "Pitty the Pore, 1684." This brings me to the subject of proverbs or mottoes. I cannot see any reason for entirely dropping their introduction on our domestic utensils. Our bread trenchers are a survival of this custom of inscribing, and we find a revival of it on some of the Aller Vale wares. Two hundred years ago a saucepan came in for its share, and certainly some wholesome advice could be given to cooks by this means; whether it would impress them is a question. The grate



Brass Tong, Bruges.



OLD BRASS TONG
FROM A SUFFOLK FARM HOUSE



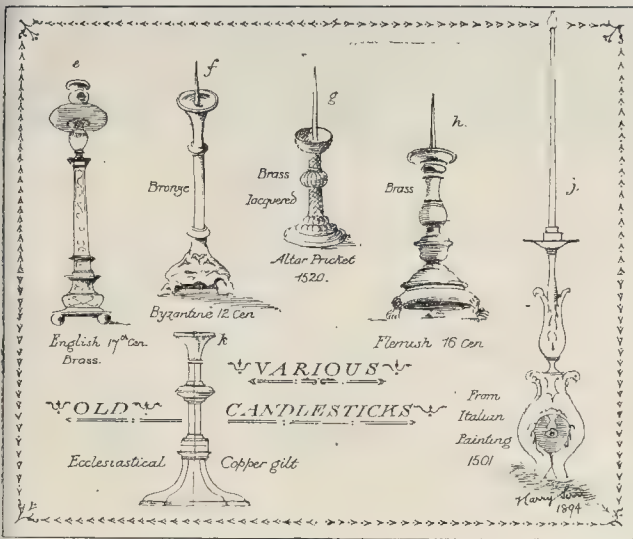
BRASS STANDARD
REST FOR
FIRE IMPLEMENTS
SUFFOLK

BRASS

IRON
DOG

or chimney-piece of an English family sitting-room is a most appropriate place for a good motto, and if lettering be only studied, it will look pleasing on a perfectly plain surface. The old iron fire plates abounded in this sort of decoration, as well as in emblems or arms, scriptural and allegorical subjects, and dates. As they should be applicable to our particular homes, temperaments, circumstances, or surroundings, perhaps it would be indiscreet to urge the introduction of mottoes strongly, as I should hardly like the enterprising manufacturers of cast-iron fenders to get hold of the notion and foist their own ideas upon us.

Let us now for a little while briefly consider some ordinary pieces of old-fashioned metal-work known to us all. I refer to candlesticks. Many people now give the light of candles the preference, and standard candlesticks are therefore still a necessity. We may assume that it has always been found satisfactory to make them at least in pairs—the common arrangement of a pair upon a writing-table is a homely illustration of the convenience of that. Within the recollection of many living people candlesticks (especially those of brass) used to be reckoned among the ordinary household effects. When lamps gained the ascendancy and subsequently gas was introduced, the candle being superseded, candlesticks went out of general use. In the country, especially in parts remote from towns, changes were not so drastic, and they were never entirely discarded. But in towns they made way for ornaments (so called) of meagre art, such as wax flowers, which then commenced to have sway. Now we have experienced a reaction, and the old candlesticks are sought after partly because it is difficult to get well-designed modern examples. I speak of England, and exempt silver candlesticks.



In olden times many materials were employed in their manufacture, but in general some metal was used, and one can hardly fail to mark the reponderation of brass, the others being principally pewter and bronze, copper also, and copper gilt, or plated. Unquestionably, however, brass is the most common of all the materials employed. This may be accounted for because it was comparatively cheap, and it may have proved more enduring than pewter, its nearest rival in this respect. The brass of which candlesticks are made varies considerably in colour, from a pale yellow to the warmer reddish hue, specimens of which are highly valued. When the colour is reddish, the metal approximates the nature of the bell-metal or gun-metal. As regards those of brass, turning entered largely into the process of making. This is referred to by Shakespeare in Henry IV., for he makes Hotspur vigorously assert his prosaic nature, and show his contempt for Glendower's boasted attainment in these words:—"I had rather have a brazen canstick turned . . . and that would set my teeth nothing on edge, nothing so much as mincing poetry. They were turned in pieces which were screwed and brazed together, or later, a turned portion as so attached to the remaining portion (as, for example, the base), which had been cast to the required form.

The designs, which are slightly sketched and illustrated, are uncommon. The varieties in shape seem to have increased and multiplied very agreeably, but the same essential parts are always present: these are a spreading base supporting a stem, which is surmounted by a nozzle or socket to receive the candle. I may observe that in earlier candlesticks we find shapes which are not met with in the Middle Ages; examples of such are in the South Kensington and British Museums. After those times the "column" and the "baluster" form are common, in the detail of which there is a charming and endless variety. For instance, we consider the column form, we shall find the stem either square or cylindrical, of equal diameter throughout, or diminishing towards the neck; or, if we study the baluster form, the shaped cylindrical stem will be found in many examples to taper upwards, or in others downwards. The spreading base may be either regular, oval, triangular, square, or oblong; or may be a variety of one of the two latter, with rounded corners. The cap at the top is hollowed out a socket to receive the candle, but sometimes is surmounted by a nozzle in the shape of a cylindrical moulded cup—occasionally vase-shaped. These instances only a few of the varieties in design. Domestic candlesticks, certainly of later times, invariably have a socket nozzle, the "prickets" being used solely for ecclesiastical purposes.

Many bad examples are to be met with, and are collected when they are not worthy of house-om as regards their design. But yet in England we have a wealth of really good shapes. Although we do not admire some of the old-fashioned

clumsy forms—made, I suspect, pretty near our own times—I infinitely prefer them to some of the fussy frail little lacquered things of modern manufacture, which only weigh a few pence. I think I have observed in manufactured ones of late a little sign of a return to old patterns. I wish those who produce or design would study the shapes and mouldings of good old examples, although I far from advocate the wholesale copying of them. How admirably some of these old examples are contoured or moulded with delicate curves, and slight projections and beads! A few simple lines and markings tell with fine effect; the projections, too, are just sufficient to catch the light, and rounded off to soften the shadows. There is an absence of crude, thick fillets, which so absolutely destroy the appearance of any good shape. What I feel is, our ancestors mastered their work well, and who will not agree with me that we, who are in possession of their productions to aid us, should strenuously strive to avoid the reproach that we, in any way, fall short of them? It is a strong conviction of this which induces me to attach some importance to an occasional examination of such common objects as old brass candlesticks, although we, as architects, are not directly concerned with their production. Nor do I claim that architects should devote their energies to the designing of such articles, except under special circumstances, for many are not fully equipped, perchance, to successfully design in metal. I keenly desire to arouse such interest in the subject as will lead to the seeking out of well-designed and executed metal-work, whatever its nature, so that a real demand for choice things may be felt. No doubt the cheap firms who so readily reproduce meaningless designs will to some extent be patronised by persons without the advantage of some art culture or of a good architect's supervision and advice, and by speculative builders, but depend upon it in the long-run this can be minimised. Good manufacturers are, I believe, naturally careful of their prestige, and there will be less to commend their goods when it is found that architects cease to admit into their buildings such as they can control the introduction of.

I am convinced it is a right step to take. We are in some measure answerable for prevailing taste. When one comes to reflect and consider what this excessive use in our day of poor and weak productions means for future generations, it ought to rouse us to make special efforts whenever we have the chance of specifying or selecting goods. Who can so far stretch his imagination to suppose that examples of our ordinary door-knockers of the last thirty years, for example, will be eagerly sought after in years to come? I have recently seen the following words of Sir John Vanbrugh quoted:—"There is perhaps no one thing which the most Polite part of mankind have more universally agreed in than the value they have ever set upon the remains of distant Times. Nor among the several kinds of those Antiquities are there any so much regarded as those of Buildings." There is great truth in this, and we

cannot fail to lament if we suppose our age will hand down to the future discreditable examples of any work intimately connected with buildings.

There is much contemporary work upon which no pains have been spared, for which we are very thankful, but I more especially refer to ordinary work. One has only to take a stroll around an old city like Canterbury to observe the care and ability which were once generally exercised in the production of such features as knockers for the humblest of dwelling-houses. I do not want to appear vehement, but after these little reminiscences it is difficult to restrain one's feelings when handling some of the trade lists and catalogues. I would not be unjust, but I think it righteous to try and create a demand for that which is essentially good. Shoddy would never hold sway if there were no demand for it, and I am quite sure simple, well-made articles can be produced in the long run, quite as cheaply as the incongruous trying-to-be-something-different-to-what-we-are kind of things which are so often offered for sale, at low prices it is true, when, however, they are dear at any price. And all this goes on, notwithstanding the new spirit which has been put into work, not only by able designers, but also by the men who are called upon to execute it. It is very distressing to deplore the lack of a due appreciation of the better work, and the consequent paucity of encouragement to all concerned.

I cannot go to the length of dwelling long upon any special objects, for my time is limited. If I were to touch upon knockers alone it would make a lengthy subject, and we should run the risk of becoming too archeological for our purpose. The majority of the Medieval ones are rather stiff-looking. In Renaissance times they became very elaborate, and very special attention was paid to their design—in fact, at times, they are overdone. I really think some of the nicest simple examples are found on ordinary houses—even small houses—of the last century, merely in cast-iron. Many of the old brass ones have been blacked over, but, as a rule, this black can be removed, and the knocker cleaned and polished up quite bright again.



What a wealth of design there is in the old door-furniture! I more particularly now refer to that on external doors which is readily seen. Look at the variety of forms in the examples I have sketched, chiefly in Bruges, Brussels, Antwerp, and Malines are quite as well off in this respect, and I recollect some beautiful lock escutcheons in Lucerne. I am sorry I cannot call to mind similar work in the old dead cities of the Zuider Zee, but I fancy there would be some good simple examples in most of them. With plates for escutcheons, locks, ring-handles, latches, &c., certainly the earliest and easiest method of rendering them ornamental by stamping them into shaped outlines survived until quite late times, when scarcely any shaping has been attempted. In much of the elaborate shaping in old examples, of both iron and brass, the screws or nail-heads were never lost sight of. The shaped piercings are generally extremely pleasing, and there is an absence of any strained effort to combine square or angular forms with their flowing lines, which are so well accommodated to the curvatures of the main outlines. Then there are forms in which moulding enters; such, for instance are some of the eighteenth-century circular or oval knocker discs, which in brass look so rich and effective, the centre generally large and convex, catching the light like a great eye. Again, there is a more elaborate treatment, as in the case of a lock-case in which a stamped perforated plate is mounted upon a plain one, and the front so made has colonettes applied to its face on either side, with terminals and pendants and tying-in mouldings.

Occasionally we come across old brass plates which are engraved or chased, and then we get

all the charm due to direct handwork. What a variety in this kind of work is found on old cabinet-work from Jacobean times down to Hipplewhite and his times!—work in which we get shaping, stamping, chasing, moulding, and embellishment with foliage and flowers in relief. Let me draw your attention to a little sketch of a cast brass escutcheon (on an old spice-cupboard), with the supporters of the Royal arms, and a shield and crown in relief.

I cannot refrain from touching upon the subject of railings, although they are more or less structural. Few will defend the use of a railing in positions where it serves no real purpose, such, for instance, as the ridge of a building. When legitimately used, it can be kept perfectly simple, with good effect; or if funds admit it can be made highly decorative. And yet to what a deplorable extent this has been lost sight of in the miles of ill-designed modern railings in the suburbs.

One seems naturally to prefer wrought-iron, because it so readily lends itself to giving variety and interest to the work; and the additional merit of lightness (which should be maintained, because it is a characteristic of wrought-work) renders it exceedingly appropriate as a boundary or a screen where the object is not also that of obscuring the view. When, however, it is essential to have cast-iron railings it is a great pity that simplicity is not more often studied. If a railing be simple the standards require symmetrical or equal spacing. When a special pattern is intended to apply to several varying lengths, such as frontages in town houses, difficulties crop up which have to be met. Now if an architect likes to leave the matter in the hands of the founder he may do so; but the founder's fitter does not always realise the importance of accuracy in adapting (which invariably means no little degree of scheming), for a few inches too many or too few are sufficient to cause real difficulties. And these difficulties occur if the curbs are not set out first, and their lengths so determined by a little adjustment as to be multiples of the spacing of the standards or the pattern. This must be considered by someone, and there is no shirking it if satisfactory results are desired. If wrought horizontal bars are used, especially holed, and every standard let into the curb, the spacing can be made to accommodate any difference in varying frontages. Any architect who takes trouble would of course arrange all this, especially if he had previously met with any difficulty; but it is quite obvious in looking around London that sad bungles of recent date are allowed to remain.

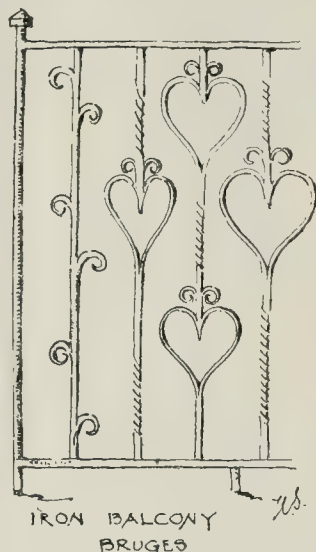
Referring to wrought-iron, fine old examples of railings and gates abound in the old suburbs of London. There are some in Highgate, for instance, and it is no easy matter to try and improve upon the simple and effective way in which the ends of the standards are treated. The extent to which the characteristic treatment by torsion is manifested, shows how well our ancestors could keep it within bounds.

I give an illustration of part of an iron balcony from Bruges.

At Berne, in Switzerland, some of the pavements are a considerable height above the roadway, and so open railings are put to protect foot-passengers and to support the handrails to the flights of steps. There is a quiet lesson to be learnt from the treatment of these. They are quite simple, the standards are well proportioned, with here and there a little brass terminal to enhance the appearance and emphasise the angles, and altogether there is quite a charm about them which an architect would hardly fail to appreciate.

I have here among some specimens of old brass-work a warming-pan. It may not be thought a very beautiful object, but my reason for showing it is to call attention to the simple ornamentation by means of piercings and some old chased work, which looks as though it had been done with a wheel run about. I consider it quaint, and a legitimate way of decorating the polished brass face. I also show an old Flemish petroleum can, which in shape cannot be said to rival some antique bronze vessels, but it is sturdy and looks suitable. The English copper coal-scuttle derives much value from the colour of the metal, but it is also very beautifully shaped. I will not claim that it is so easy to scoop from as one which is flatter in the bottom; much, however, depends upon the shape of scoop. But it probably was meant for fair-sized knobs of coal (and not dust), which would be lifted out with tongs. The little Flemish cast openwork teapot-stand is a pleasing piece of work, and the old wall spill-box, in brass, is interesting, with its slightly chased simple border. The old English "footman" or

trivet, I think, is especially good. It is noteworthy how general a favourite the "harp" pattern is, and here is an example in combination with conventional leaves. These oddments, I claim, do show rational treatment, and they are pleasing in appearance. Of such things, there are several foreigners in the South Kensington Museum. To instance a few: there are a Dutch eighteenth-century birdcage; a pair of eighteenth-century sconces, also Dutch, with an effective



ribbed border; a sixteenth-century French fire-guard; with a border of acorns and oak leaves; a beautiful Dutch eighteenth-century oval brass repoussée jardinière—the lower portion gadrooned; a French seventeenth-century stew-pan, with a ring of foliage ornament in relief; numerous candlesticks, brass lanterns, and candelabra.

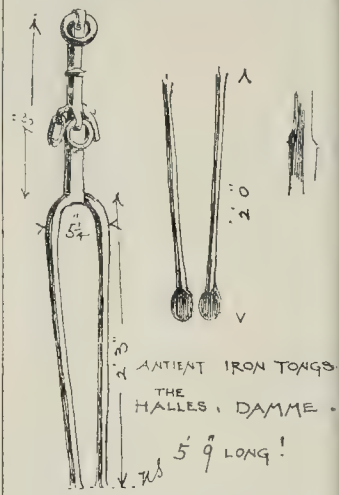
I have not in all cases referred to old objects because of any distinct utility they necessarily possess at the present time, as you doubtless will have remarked, and of course I do not draw the line at old objects, but the time is limited upon such modern work. I have here, however, some beautiful examples of copper and brass work, kindly lent by Mr. Mackmurdo, which you will see are cleverly and artistically designed and worked. There are three copper sconces with allegorical figure subjects, and two brass ones. Look at the fine way in which the heads of the figures are executed. They are not intended to be elaborate. They are really suggestive sketches, as it were, in the metal, which Mr. Mackmurdo himself designed, and had executed by his own artists, and there is a fine original treatment in the beaten brass-work which is thoroughly appropriate, and shows how well the capabilities of the metal have been understood. And please also observe the brass sconce, how simply it is treated, but with what admirable effect, due solely to the slightly-raised beadings, &c., the silhouette, and the tender convexities that have been raised on the main sheet of metal. I think they are fine lessons in themselves, and we are much indebted to Mr. Mackmurdo for his kindness in letting us have them to examine.

I am grateful to Mr. E. J. May, who has called my attention to the iron-work of some of the old-fashioned scale-makers (with its good colouring, and decorative brush ornamentation), which, as he points out, is no doubt traditional. Mr. May also kindly lends some interesting specimens of seventeenth-century Sussex iron-work, tongs, &c., which show thoughtful treatment. Mr. Guy Dawber kindly lends two fine Dutch candlesticks in brass, and a pair of Flemish pewter candlesticks of beautiful design. Mr. Hugh Stannus has gladly lent some specimens of old English brass candlesticks, and Mr. Francis Hooper some of his own sketches.

Allow me to remind you that the late and talented E. J. Tarver once sketched a good many of the old fanlight grille patterns which used to abound in London, and his sheet of sketches was

published in the *Builder*. I think he rendered great service by doing so, as they are fast disappearing, and are certainly worthy of record.

In the study of all the old objects I look upon it as essential that we should critically examine them, bearing in mind the uses to which they were put in the olden times in order to realise the problem presented, its solution, and also the extent of legitimate embellishment, and how far



its application is satisfactory; i.e. (firstly), without deteriorating from the utility; (secondly) with the result of enhancing the appearance; (thirdly) while retaining in the form some suggestion of the function of the article which gives it the special character.

The obvious exigencies of modern life and the facilities of reproduction in manufacture compel repetition. With such opportunities of sowing it broadcast we have a strong argument in favour of good art, and of educating the community and familiarising them with beautiful forms and reasonable ornament. And it is the more necessary that this should be brought about, and that speedily, in order to remove an idea which largely prevails that it is merely the wealthy, or those possessed of ample means, within whose power it lies to acquire good honest design and work.

Nothing so much as the hurried march of modern times, with its great facilities of reproduction, has led to the truly appalling results of an uncouth desire to have something which is ambitious which we have witnessed, and which have been pitchforked at us from time to time, in the shape of bad copies of work of bygone ages made in a shoddy way, with no understanding of the old spirit, but in sickly nerveless imitation—sometimes in altogether different and inappropriate materials. As a mild instance of this, look at the way in which wrought-iron has been imitated in cast-iron. What a lack of resources!

Cheap ambitious church metal-work has long ago been loudly condemned, and quite properly, by all who know anything about the good work, because the former is so often a feeble attempt at copying the old work with no grasp of its character at all. But I have never yet seen much said on the subject of bad domestic metal-work, and I think I have urged sufficiently strong reasons for a protest.

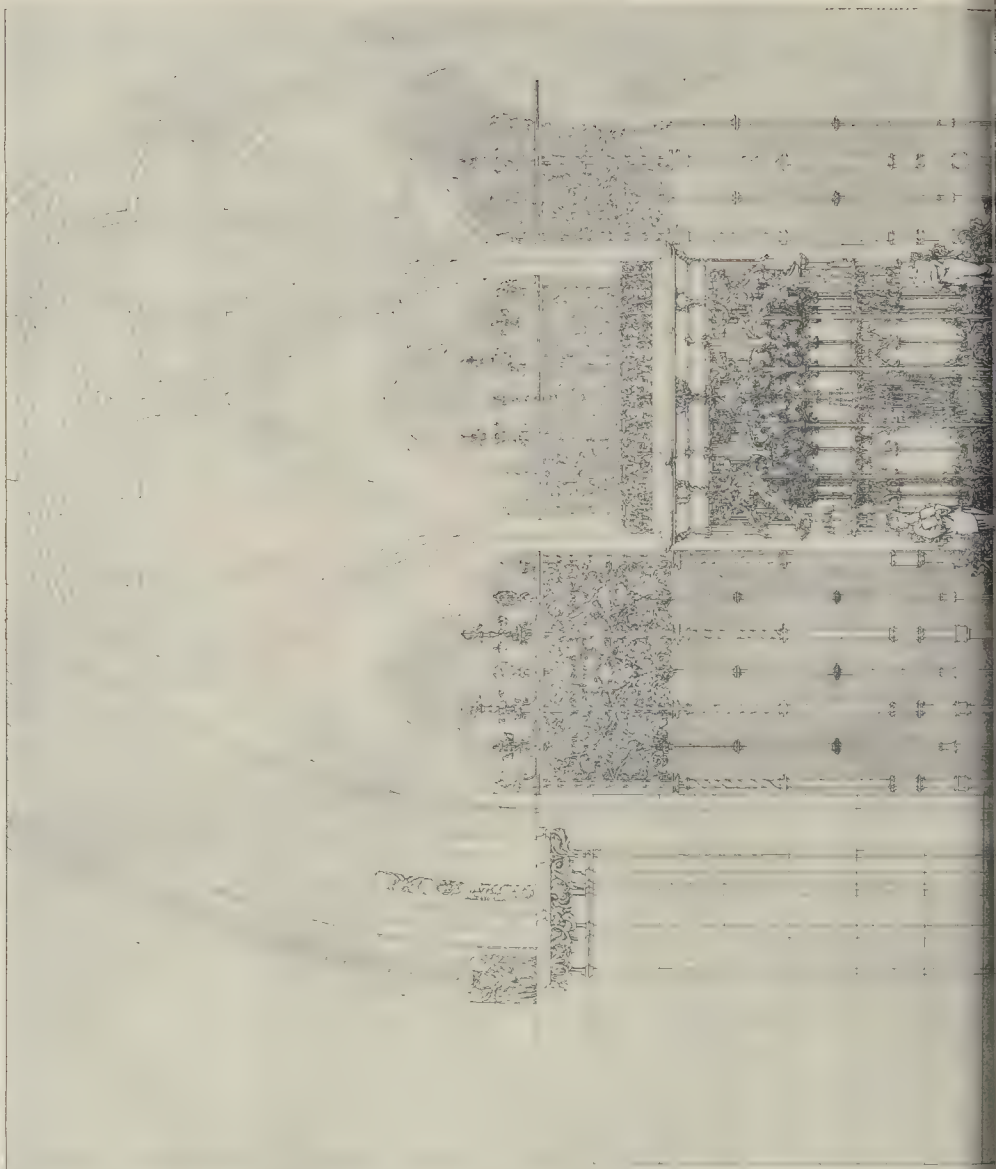
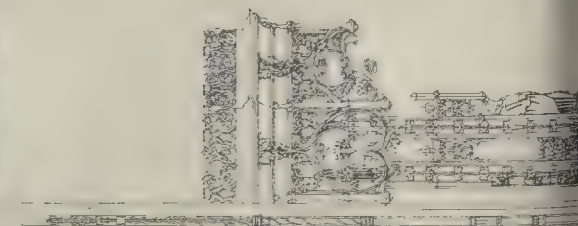
There is a vulgarism which is frequently applied to persons or things which have not been improved by some change. It is the comprehensive expression "Its own mother would not recognise it," and this can be well hurled at such frauds as either the pseudo acanthus or honeysuckle, which have often been turned out to pervert the taste—nor would they respectively claimed prototypes own them if they could find anything at all recognisable about them.

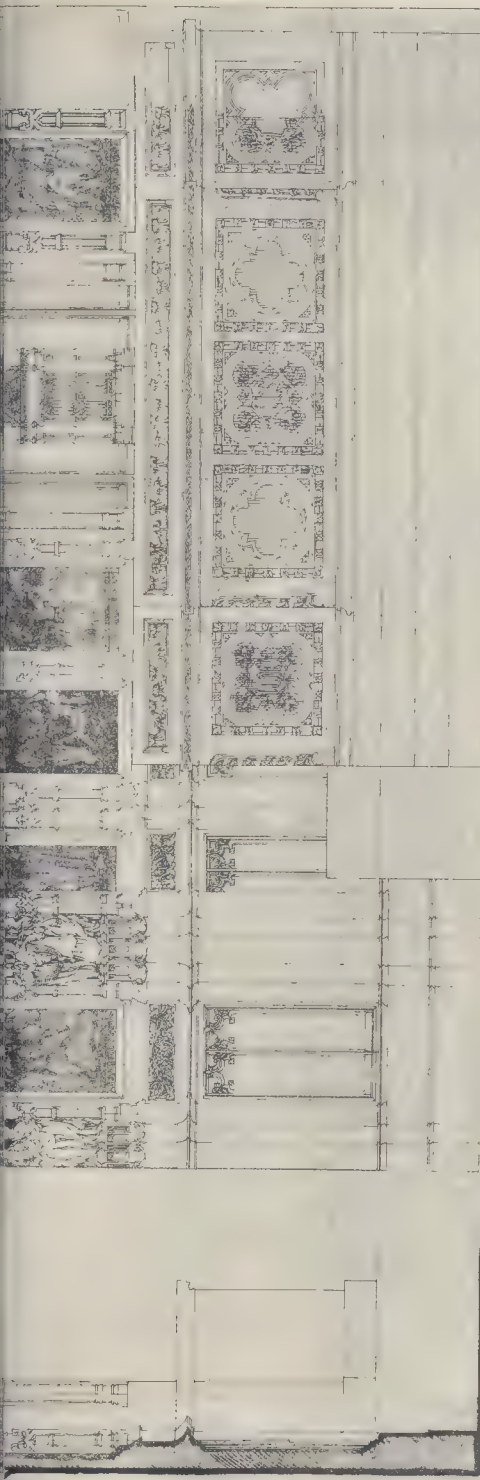
I am reaching finality, and I have done scant justice to the subject, for it is impossible to say much in so short a time, and I have not even dwelt upon pewter or lead. There is such a wealth of design, too, in the old lead rain-water heads, broken up as they are with different returning planes and angular excrescences, embattled or ornamented with rope pattern, necked-heart or pear-shaped, funnelled from a square



THE BUILDER. SEPTEMBER 7, 1895.

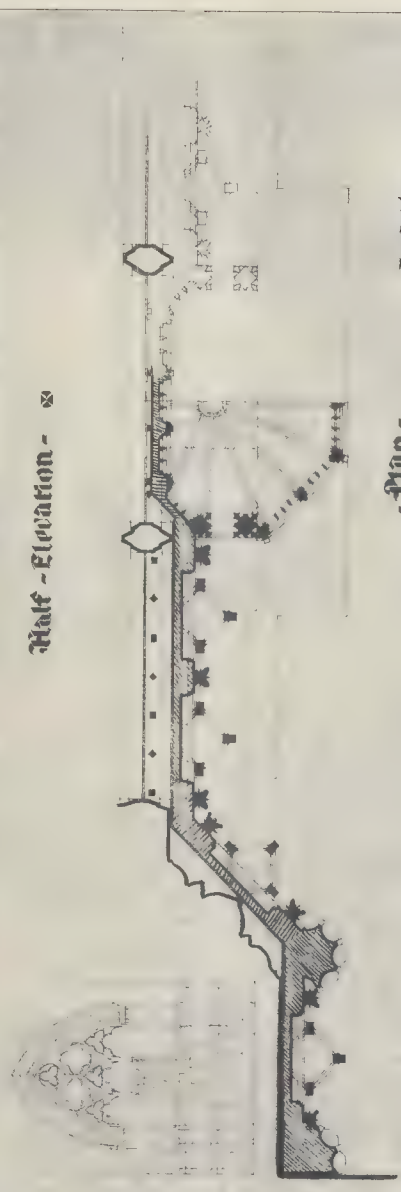
Catholic Apostolic
Church London Sq.
Shoreditch.





Section.

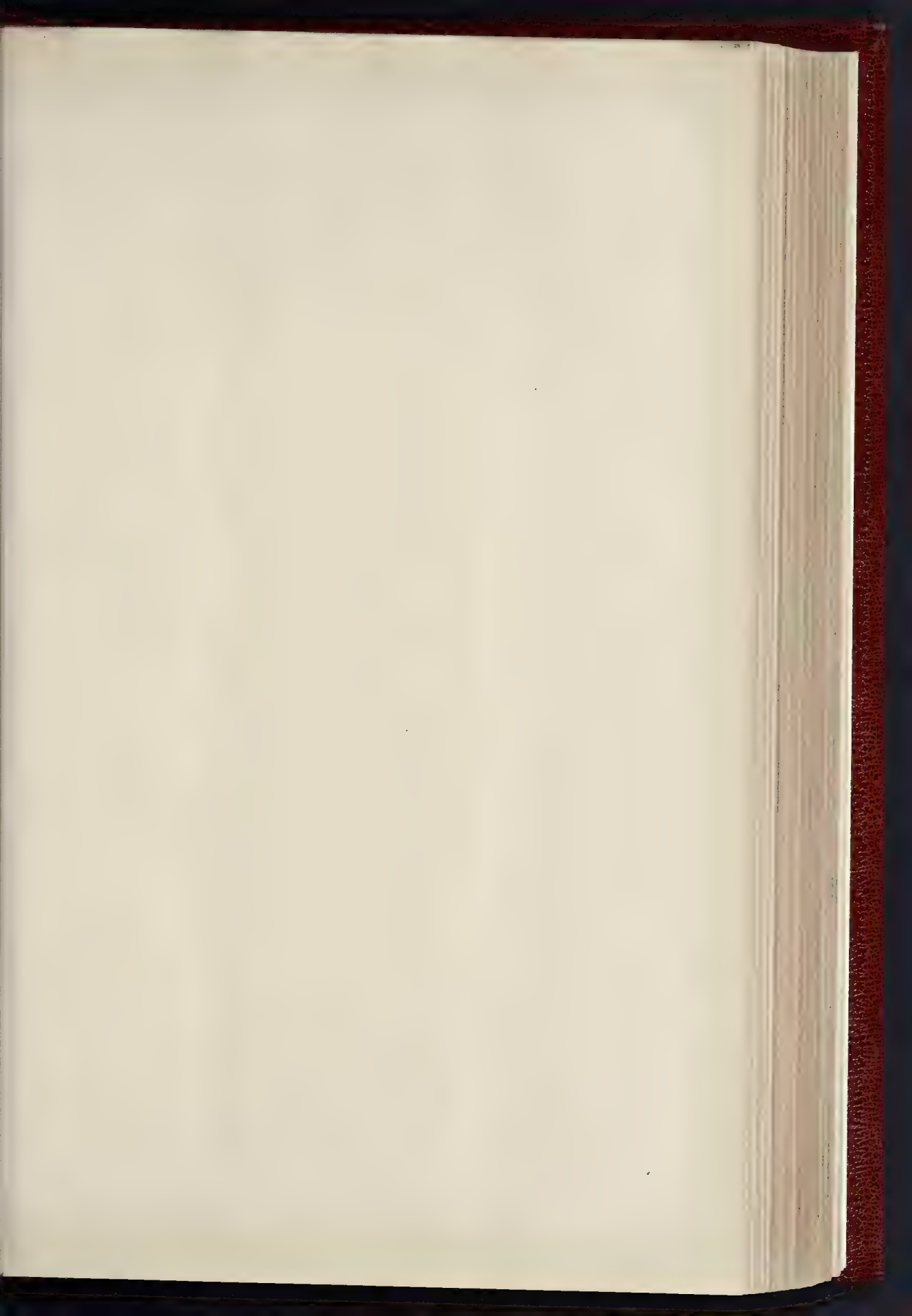
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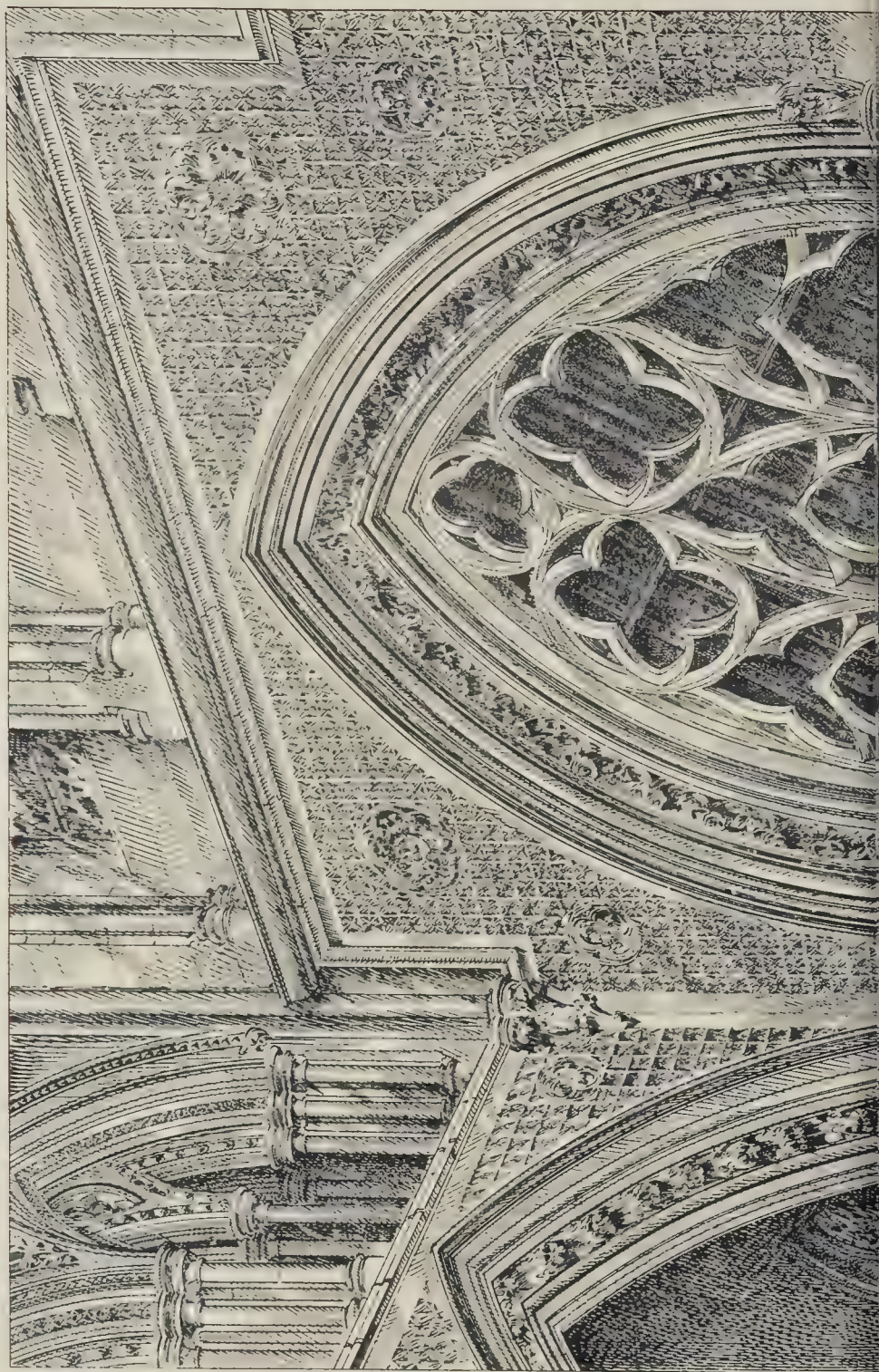


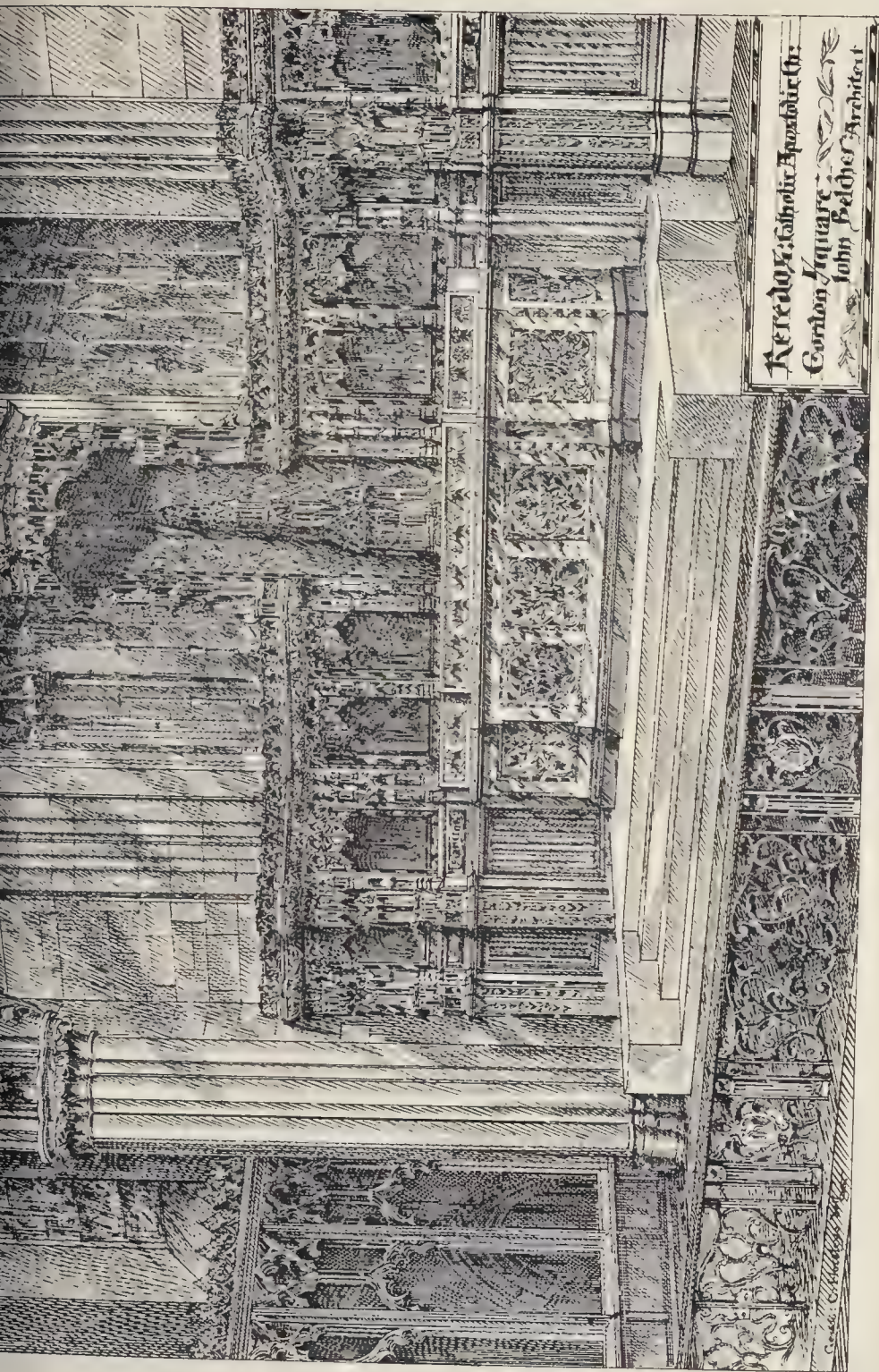
- Plan -

John Belcher
Architect -
115 Broadway -
New York City -
Superintendent

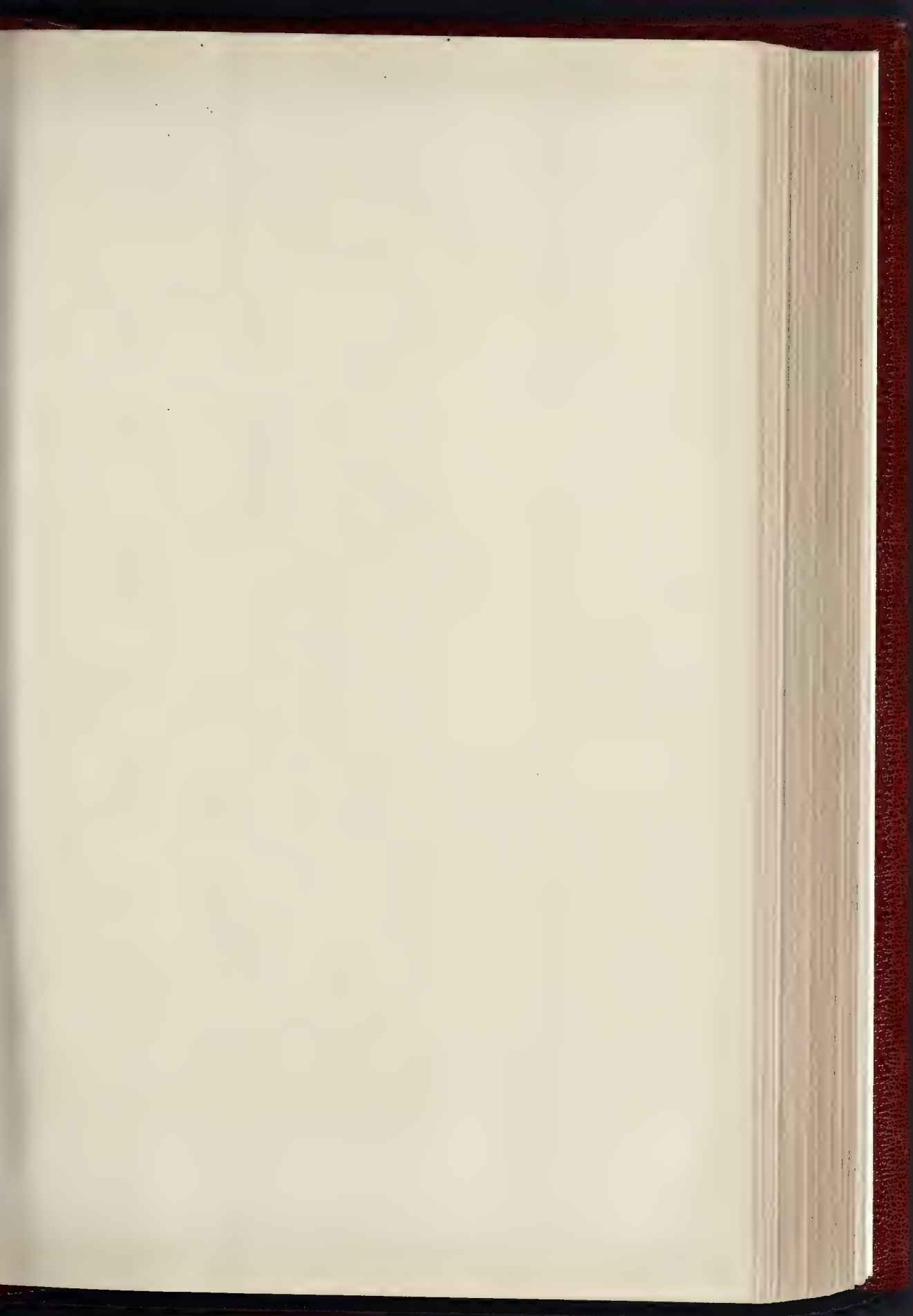
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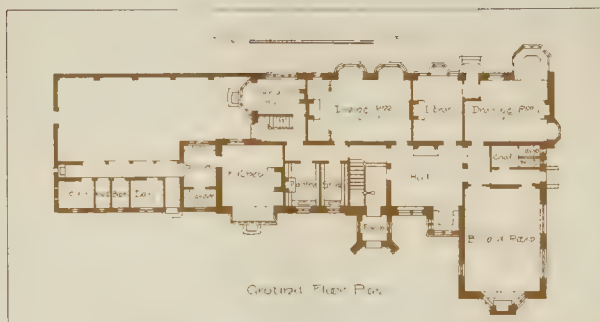






Keredor Catholic Apostolic Church
Gordon & Co. Engravers
John Belcher Architect





HOUSE AT OXTED ENTRANCE



R. A. BRIGGS, F.R.I.B.A., ARCHITECT





HOUSE AT ONTIO GARDEN



A. BRIGGS, F.R.I.B.A., ARCHITECT

into a flat soffit, or the head itself gradually wing into the pipe. But I cannot dwell upon nor many other works which so well merit attention.

In conclusion, I will venture to say that I am sick of the want of restraint and simplicity in much of the manufactured metal-work of the day, especially in such utensils and objects of furniture (I have touched upon, while, on the other hand, some things there appears to be a dearth of large attempts at giving a little more interest to the work. This latter fault, I think, is noticeable metal internal door furniture, which, although possesses a purely utilitarian character, is often (thy of more thoughtful treatment, as, for example, better shaping or contouring of the plates, or more play of line in finger-plates) want of fear of destroying their usefulness. But want of restraint is the greatest evil of all, and it undoubtedly requires much effort and patience on our part to exercise control, and to comply whenever we may be called upon to do with ordinary manufactured goods. I have referred to all the objects exhibited here, or which I have spoken of, because it invariably falls our lot to select such; but they are part of my life, and to some extent they go in conjunction with fittings. And the same spirit is met with in good work, as regards the appropriate treatment of the metal or material. I also thought it did lend much additional interest to my paper. Architects, it is desirable we should take an interest in all specimens of workmanship, we must be many-sided. It is on this account I have not hesitated to bring before this (or section of the Architectural Association, at our kind invitation, a subject which is full of interest, and which, I venture to think, is as thy your notice as some which might be considered more strictly practical matters which, perhaps, I could have spoken upon, but, I confess, with hardly the same enthusiasm. I hope I have made something of a case for Domestic metal-work—at all events, that you will not vit me of being nebulous in my views

Illustrations.

THE NEW REREDOS FOR THE CHURCH IN GORDON-SQUARE.

THE new reredos is designed to be carried out in oak, and the panels are to be decorated in colours with figure subjects. The lines of the cornice and "tabernacle work" be emphasised with gold. The stone carving the church is now being carried out by Messrs. Brindley & Farmer, and promises to be successful. The proportion and value of several parts can now be better appreciated. It is to be hoped at last this fine cathedral-like thing, designed by Mr. Brandon, may be completed. When this is done, and the unusual oddness of the east end is remedied, there will be no finer church in London.

The present work is under the superintendence of Mr. John Belcher, Hanover-square, W.

HOUSE AT OXTED.

THIS house is now being built at Oxted. The walls are faced with red Dunton Green bricks, the roofs are tiled. The stone dressings are from Monk Park. The whole of the woodwork inside and out will be stained dark brown.

The works are being carried out by Messrs. T. H. L. Limited, of Watford. The drawings of which these illustrations are taken were made by the architect, Mr. R. A. Briggs, from designs and under whose superintendence the house is being erected. Both the drawings and the house in the last Academy Exhibition.

ARCHITECTURAL ASSOCIATION: PAPERS FOR THE NEW SESSION.

THE annual general meeting of the Architectural Association will be held on the 11th prox., in the President, Mr. W. D. Caroe, will deliver an address. The following is the scheme of papers for the approaching session:—November 8, "Imperial," with lantern illustrations, by Mr. H. E. E. M.A.; November 22, "The Municipal Buildings," by Dr. G. B. Staff, L.C.C.; December 6, "Scenic Art," by Prof. Herkomer, A.R.A.; Dec. 20, "Brick-work," by Mr. R. Rust; 1896, January 10, "Municipal Buildings," by Mr. Henry T. Hare;

January 24, "Copper," by Mr. Nelson Dawson; February 7, "Technical Institutes," by Mr. Sidney H. Wells; February 21, "The Modern Stencil," by Mr. Arthur Silver; March 6, "Masonry (Practical Stone-work)," by Mr. Hervey Flint; March 20, "The Architecture of the Teutonic Order, with particular reference to the Restoration of the Marienburg," by Mr. C. Fitzroy Doll; April 24, "The Present Position of Architecture at the Royal Academy," by Mr. Francis E. Masey; May 8, "Fabrics," by Mr. Aldam Heaton.

ARCHITECTURAL SOCIETIES.

PROPOSED ARCHITECTURAL SOCIETY, DEVONPORT.—A meeting of architects and assistants was held at the office of Mr. Henry George Luff, Devonport, on the 31st ult. Among those present were Messrs. Dwelly, Greenwood, Harris, Leest, Luff, Mill, and Shires. On the proposition of Mr. Luff, seconded by Mr. Greenwood, Mr. Priestley Shires was elected to the chair, and Mr. Edgar Leest was elected Honorary Secretary (*pro tem.*) The Chairman explained that the meeting had been called, on the proposition of Mr. Edgar Leest, to consider the advisability of forming a local Architectural Society, and he thought it was very desirable that such a Society should be formed for the general benefit of the profession. Mr. Luff proposed "That it is desirable to form an Architectural Society in the Three Towns, to be a branch of the Devon and Exeter Architectural Society, providing their terms are acceptable to the next meeting." Mr. Dwelly seconded the motion, which, on being put to the meeting, was carried unanimously, and the Hon. Secretary was directed to write the Devon and Exeter Society as to forming a branch. A vote of thanks was accorded the Chairman on the proposition of Mr. Greenwood, R.E.E., and seconded by Mr. Luff. The Hon. Secretary will be glad to give any information on the subject to those architects and assistants who were unavoidably prevented from attending, on application to Laboratory House, Mount Wise, or 64, Chapel-street, Devonport.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—A new feature in connexion with the architectural classes of the Glasgow and West of Scotland Technical College, is the institution of day classes, which will meet every week on Mondays and Thursdays from 9.30 to 12.30. The lecturer is Professor Gourlay, who will deliver a junior course of six lectures, as well as a senior course of the same number, with tutorial instruction in the studio. The evening classes show that the number of lectures in the first and second courses in architecture are to be increased from sixteen to thirty in each course. In the first course Professor Gourlay will deal with architecture till the end of the Roman period. In the second course, which is specially arranged for Scotch students, he will deal with the English and French Medieval, and afterwards with the Scotch, showing the influence of the English and French work upon the Scotch work of the same period. In the third course, he will treat of the history of architecture in general, and deal particularly with the Byzantine and the Renaissance periods. The courses in the studio and in construction are gradually being improved. Mr. Gourlay is assisted by Messrs. Lochhead, Fraser, and Moodie.

GLASGOW ARCHITECTURAL ASSOCIATION.—The opening meeting of the winter session of this Association was held on the 3rd inst. in the new rooms, 187, Pitt-street, Glasgow. The premises, which are jointly tenanted by the Glasgow Institute of Architects, were occupied for the first time, and there was a large attendance of members and others interested. General satisfaction was expressed at the manner in which the house has been adapted to the various requirements of the two Societies. After the preliminary business had been transacted, the President, Mr. Alexander N. Paterson, M.A., delivered an address. The first part was devoted to a survey of the work of the past session, particular reference being made to the progress of the schemes suggested by him in last year's Presidential Address. Whilst the projects for acquisition of improved premises, and co-operation with the Glasgow Institute of Architects had been successfully accomplished, the third-increase of membership—had been, to a certain extent, delayed, pending arrangement of the first-named schemes. With the additional attractions the Association now offered to the junior members of the profession he anticipated a large increase, and commended improvement in this respect to the energies of the members. Referring to the memorials addressed to the respon-

sible authorities relative to the Tron steeple and cathedral, Mr. Paterson said, in so doing the Association was fulfilling one of its functions in the promotion of architecture in Glasgow, and indicated the action of the Corporation in entrusting the designing of public buildings to a section of a department primarily concerned in works of a purely utilitarian character, as a matter demanding immediate attention. He further suggested the institution of a class of lay members, gentlemen neither connected professionally nor inferentially with architecture, but who were interested in it for its own sake. The second part of the address was entitled "Archæology, History, and Art," between which the lecturer continued, there existed an intimate relationship. The connecting link lay in the continuity, the traditional character of art, and particularly of architecture. To the architect who was ever seeking to assimilate and reproduce in his work the spirit of the old masters, even when endeavouring to solve the very different problems of the present day, the doctrine and practice of the ancients was of paramount importance. Proceeding to analyse and differentiate between archæology, history, and art, he said the first two were so closely interlinked that the one could scarcely be said to be complete without the other. Broadly speaking, however, the one was concerned with monuments, the other with events; the one with the actual details and arrangements of the buildings, the other with the significance of these as made clear by the habits and actions of the society of the time. Art was on an entirely different plane from the others, and for purposes of comparison with them, it might be expressed in its widest sense as the creation of the beautiful. Considering architecture as an actual occupation, not as a theoretical study, the relationship between the terms of the title might be concisely put by saying that art, from the architect's point of view, was concerned with the design and erection of buildings in the present time, that the art in these buildings was a necessary and natural outcome and development of similar works in the past, and that archæology and history were the branches of knowledge by which we best arrive at a knowledge of such work. Architecture, from its close dependence on construction, was of all the arts that most closely ruled by tradition. It was scarcely possible to think of design apart from those symbols and formulae that have come down from the past. The insistence on the traditional, the national, and even the local type, constituted at once one of the main interests and healthiest signs of a living architecture. The lecturer went on to consider, on the one hand, how far the influence of archæology and history was beneficial and of real value in connexion with everyday work, and, on the other, whether such influence was not by some allowed to preponderate to a hurtful extent, and even at times to lead to a confusion of identity between the means and the end. Accepting archæology as a scientific aid to study, and associating with it its necessary complement of history, it was difficult to imagine any subject more worthy the attention of the architect. At the conclusion of his address, Mr. Paterson received a very hearty vote of thanks.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—The Council of the Institution of Civil Engineers invites Original Communications on the Subjects included in the following list, as well as on any other questions of professional interest. This list is to be taken merely as suggestive, and not in any sense as exhaustive. For approved papers the Council has the power to award premiums, arising out of special funds bequeathed for the purpose:—The most economical Methods of Handling large masses of Excavation, as exemplified in modern canal construction. The Measures necessary for the improvement of Canal Navigations. The Methods adopted in carrying out large Dock and Harbour Works, with descriptions of the Plant employed. The Appliances for Dredging and for Removing Rock in deep water, with details of the time occupied in the various operations. The Application of Compressed Air, steam and hydraulic power to Rock-drills. The Construction, Equipment, and Working of Light or Economical Railways of a permanent character. The Design and Construction of Railway Carriages, having reference to (a) lavatory accommodation; (b) provision for refreshments; and (c) sleeping arrangements. The Use of Compressed Air in Subaqueous Tunneling. The Modern Methods of Pumping com-

pared as to cost and efficiency. The Use of Steel in the Construction of large Water-Tanks. The Employment of Storage-Reservoirs in Irrigation and in the Conservation of Rivers. The Purification of Sewage by precipitation, filtration, electrolytic, bacteriological, and chemical processes. The Use of Ash-bin Refuse in towns for the production of steam. The Purification of large quantities of Water after its use in Manufactories. The Methods of Enriching Coal-Gas and their effect on its calorific and illuminating values. The Production and Enrichment of Water Gas. The methods of conveying and of using Natural Gas. The Utilisation of Heat (a) generated in the compression of air and other gases; (b) carried away by steam-engine condenser-water; and (c) contained in boiler-furnace flue-gases. The Methods of Condensing Steam by the use of moderate quantities of water. The Methods of removing Moisture from Steam, and of reducing losses by radiation from steam-pipes. The Production and Use of Super-heated Steam. The Theory and Development of the Compound Steam-Turbine. The Recent Developments in Gas-Engines and Oil-Engines, including a comparison of the relative merits of the several Cycles, with reference to "after-burning." The Application of Oil- and Gas-Engines to tractive purposes on common roads and on tramways, and to the propulsion of vessels. The Design and Construction of large Turbines. The Methods of Testing the Lubricating Values of Oils, Greases, &c. The Comparative Merits of Blast- and Reverberatory Furnaces. The Influence of Carbon on Iron. The Magnetic Properties of Iron and Steel. The Manufacture of Steel for Structural Purposes. The Strength of Steel Shafts, Tubes, and Cylinders. The Efficiency of Centrifugal Fans for forced draught and for the Ventilation of Mines. The Drainage of Mines by Pumping and by Tunnelling. The Extraction of Metals from their Ores by electrolytic processes. The Occurrence, Production, and Uses of (a) Asbestos, (b) Arsenic, and (c) Mercury. Aluminium, its manufacture, properties, uses and alloys. The Metallurgy of Chromium, Molybdenum and other rare metals, and their use in the Manufacture of Steel. The design, construction, erection and working of Modern Stamp Mills. The Machines for Raising Mineral Tailings, as lifting-wheels, pumps, dredgers, &c. The most suitable Steam-power Equipments for Electric-light stations. The Utilisation of Electric-lighting Plant during hours of small demand. The Utilisation of Electrical Energy in the form of heat. The Regulation of Electric pressure in large lighting circuits as carried out at the engine, the dynamo, or the exciter. The Theory and Practice of the Transmission of Power by Alternating Currents. The Use of Electrical Motors for driving machines in textile factories and in engineering workshops. The first cost, facility, and economy of operation of Electrical Traction on Railways with heavy trains and on Tramways. The Construction and Working of Electrical Lifts and Cranes. The Electrolytic Action of Return Currents in Electrical Tramways on gas- and water-mains, and the best means of providing against Electrical Disturbances. The most suitable Alloys for the working parts of Pumps for lifting corrosive liquids from mines, &c. The Methods of Preventing or Arresting the Corrosion of Hydraulic Rams of large diameter. The Use of the Die-press in workshop operations. The Modern Rolling-Mills of the United States. The different systems of Refrigeration, and of appliances for the storage and Preservation of Food Produce. The Use of Electrical Machinery for lighting and the transmission of power in war-ships and in the mercantile marine.

Correspondence.

To the Editor of THE BUILDER.

ARCHITECTURE AT THE ROYAL ACADEMY.

SIR,—I would beg to solicit a corner of your valuable space to say a word in regard to Mr. Aitchison's proposal to admit models and photographs into the Architectural Room of the Royal Academy. It seems to me that Mr. Aitchison is regarding architecture as a fine art. Strictly speaking—and one cannot be too precise in a matter of this kind—architecture is not a fine art, the only fine art in connexion with building is that of architectural designing. Models and photographs of buildings are consequently inadmissible; they are not fine arts themselves, neither do they represent a fine art. It is impossible

within the limits of a letter to deal with this important subject. I would venture to remark however, that, in my opinion, the policy pursued by the Academical Authorities during the last four or five years has been, to say the least, most unfortunate; the tendency is to encourage architects, who are pursuing their craft as a *business*, to the discouragement of those pursuing it as a *profession*, or, in plain words, to foster architectural advertisements, to the exclusion of architectural designs.

R. F. CHISHOLM.

Heidelberg.

SWANSEA SCHOOL BOARD COM-PETITION.

SIR,—The terms of remuneration to architects were fixed against my advice.

E. R. ROBSON.

SIR,—I write to correct a mistake which I find I made. I stated that the rate of remuneration offered by the Swansea School Board on a former occasion was 4 per cent., including quantities, whereas, I find it was 5 per cent., including quantities, superintendence, and travelling expenses.

They also bound themselves to employ the architect to whom the first premium was given in case the work was carried out. I suppose the clause in this present case suggesting the "probability" of their employing the architect placed first is a "refinement" taught by experience.

H. W. WILLS.

The Student's Column.

METALS USED IN BUILDING.—X.

CALCIUM.

THE alkaline earthy metal calcium is not found in a free state in Nature, but it enters into the composition of a very large proportion of the earth's crust. In one form or another its compounds are exceedingly useful to the builder. We have not space to enter into details concerning their employment; on previous occasions our "Student's Column" has contained much relating to them in certain connexions, but the following summary will serve to impart a general idea of the uses of calcium compounds as a whole.

Calcite, or calcium carbonate, occurs both in an earthy and a crystalline condition; its chemical composition when pure is lime 56 per cent., carbonic acid 44 per cent. It is a comparatively soft mineral; even in the crystalline form it may be easily scratched by the point of a knife, and when earthy may be quite pulverulent. The chief varieties of carbonate of lime, so far as they affect our present inquiry, are:—

1. *Limestone*. In a more or less earthy condition this forms a common building stone, as, for examples, Bath and Portland oolites, and Ham Hill (shelly) and Tottenhoe (chalk) stones. In a crystalline form it constitutes statuary (Carrara, &c.) marble, and fossiliferous marbles such as those from Devonshire, Derbyshire, &c.; also hard building stone, as at Hopton Wood, near Wirksworth. The harder limestones are commonly used locally as road-metal, for which purpose, however, they are not very suitable. On being calcined the carbonic acid present in the material is driven off, and thus ordinary builders' lime is made. Whiting is manufactured from chalk. The purer kinds of limestone are used as a flux with iron, &c., and they have abundant uses in other metallurgical operations.

2. *Iceland spar*; a pure and transparent form, very rare at the present time, is utilised for the polarisation of light.

3. *Stalactites* formed in caverns are polished as a species of marble.

4. *Travertine*, or calcareous tufa, made by the action of springs, the water of which is largely charged with carbonate of lime, is a somewhat cellular material, used as a building stone in certain parts of the world.

Aragonite has the same chemical composition as calcite, only it crystallises in a different system, and is not so durable as that mineral, further, it is heavier. It enters into the composition of certain limestones, and other building stones where its presence is very undesirable on account of its being so easily decomposed by atmospheric agencies.

Dolomite, or magnesian limestone, is carbonate of lime and carbonate of magnesia in about equal proportions. It is much used as a building stone, the Houses of Parliament being built of it, for instance. When in a crystalline condition, mag-

nesian limestone is very durable, but when only partially so it makes a very inferior stone. Masses of dolomite is manufactured into good hydraulic lime and basic bricks.

Gypsum, hydrous sulphate of lime (lime, sulphuric acid, and water). It occurs in massive beds, and when crystalline constitutes alabaster. On its water being driven off, it is ground up, which form it is known as plaster of Paris; with the addition of certain other ingredients careful preparation, it forms Keene's cement. Crystals of gypsum are called selenite, which can be made into cement of a high quality. A fibrous variety of gypsum, called satin-spar, is used for ornamental purposes. In common with other compounds of calcium, it is found in water, and assists to form "scale" inside boilers. Water containing much lime is said to be hard.

Fluor Spar, fluoride of calcium, is a source of hydrofluoric acid, of importance for producing ornamental patterns on glass. When fairly transparent, and of good colour, it is manufactured into vases and other ornaments ("Blue John" especially in Derbyshire, where it is found in considerable quantities, though really handsome fluor-spar, is somewhat rare. The mineral is also used as a flux in many metallurgical operations.

CADMIUM.

This is a white, ductile metal found principally as a sulphide, of citron colour, which is used as paint. It occurs in Renfrewshire, Bohemia, and at one or two localities in the United States.

SILVER.

When speaking of lead we remarked (ante p. 67), that when that ore was argentiferous, silver was always extracted when present in sufficient quantity, but there are several other sources of the metal. The following brief summary gives a general conspectus of the principal ores of silver, viz.:—

1. *Native silver*, which generally contains small proportions of gold and copper. It is found as leaf-like pieces, sometimes as a number of crystals strung together like beads. It is readily recognised from its silver-white appearance when fresh, but on exposure to air it rapidly tarnishes, in which condition it might easily be mistaken for other minerals. An amalgam of silver and mercury occurs abundantly in parts of Chili. The native metal is often found also with platinum, bismuth, and antimony. It is readily converted, is comparatively soft, and soluble in nitric acid. Silver may be recovered from galena by cupellation, i.e., by oxidising the latter. This process depends upon the facility with which the galena is converted into an oxide by the action of air at a high temperature, while silver is hardly affected; the lead-oxide being melted very readily is partly removed in a liquid state and partly absorbed by the porous hearth upon which the silver remains.

2. *Argentite*, silver glance, or sulphuret of silver, is a dull, dark-lead ore, is not so heavy as the native silver, but contains about 87 per cent. of the precious metal when pure. It is the commonest ore of the metal, if we exclude argentiferous galena. As might naturally be supposed, the sulphide of silver is most abundant in association with the sulphides of other metals.

3. *Stephanite*, or brittle silver ore is a sulphide of silver and antimony, possessing about 68 per cent. of the former metal.

4. *Horn silver*, the chloride, occurs plentifully in Chili and Peru, sometimes in large fragments. Typical specimens exhibit a horn-like appearance.

5. *Pyrrargyrite*, an ore of a dark-red colour, sulphide of silver and antimony, with about 60 per cent. of silver.

6. *Proustite*, or light-red silver ore, is sulphide of silver and arsenic, having from 60-65 per cent. of the precious metal. This and pyrrargyrite are often alluded to collectively as "ruby silver."

Two other ores of great value where occurring in any quantity are *Freibergite*, sulphide of silver, lead, and antimony, with about 22 per cent. of silver; and *Polybasite*, sulphide of silver, copper, antimony, and arsenic (quite black) contains about 70 per cent.

Silver occurs usually in veins or lodes, but in Stormont, in Southern Utah, is found impregnating beds of sandstone, interstratified with shale, being rich enough to be worked alone in three or four horizons. According to the observations of Mr. W. Lindgren, the metal is distributed irregularly, and the mining is confined to "shoots" or "chimneys," which sometimes follow one particular stratum of the general ore-bearing bed, and sometimes cut across it. The

* "Trans. American Inst. M.E.," Vol. XV. (1896-8), p. 725.

ore exists as sulphide and chloride, but there is a little native silver; it is found principally along fractures or bedding planes.

As an example of the occurrence of the ore in one of the richest silver-producing districts in the world, we give the following illustration (fig. 9),

Fig. 9.

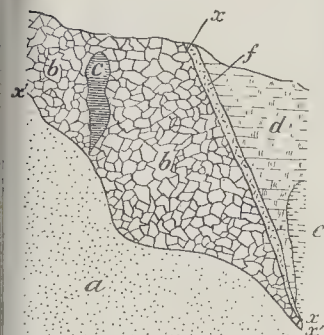


FIG. 9.—Section of Phoenix Mine, Eureka, Nevada.

a = Quartzite. b = Crushed limestone containing the ore (c). d = Limestone. e = Shale. f = Igneous rock. g = Faults.

which relates to the Phoenix mine, on Ruby Hill, Eureka District, Nevada. From this we observe that the main features of the locality consist of quartzite (a) and limestone (d) between which is a mass of the limestone in a very much crushed condition (b) bounded by faults (f, g) at its junction with both the quartzite and normal limestone, or rather with the igneous rock (e), forming a dyke along the line of fault on the side nearest the limestone. Within the wedge-shaped body of crushed limestone all the ores of sufficient value to pay extraction occur.* As will be gathered from the diagram, the ore body is very irregular in shape, and this observation applies also to other mines in the neighbourhood, where the rich parts are of every conceivable shape and size, some measuring more than 100 ft. in all directions.

The following analysis of all the ores contained in these remarkable mines as smelted at a furnace in the district may be quoted:—

Chemical Composition of Ores, Eureka District, Nevada.

Lead oxide	35.65
Bismuth	15
Copper oxide	15
Iron sesquioxide	34.39
Zinc oxide	2.37
Manganese oxide	13
Arsenic acid	6.34
Antimony	25
Sulphuric acid	4.18
Chlorine	—
Silica	2.95
Alumina	64
Lime	1.14
Magnesia	41
Water and carbonic acid	10.90
Silver and gold	10

The proportion of silver and gold here would seem to those unaccustomed to the examination of ores to be very minute. Yet put in another way, a short ton (2,000 lbs.) of such ore, would yield 27.55 troy ounces of silver, and 1.59 troy ounces of gold—which are regarded as high percentages.

It is stated that some part, at least, of what is called lead oxide in the above analysis must be lead sulphide. Other analyses of the ores in this richly mineral district, demonstrate the existence of silver to the extent of 1.01 per cent., and gold .001 per cent.; the gold pays for extraction. Other localities producing silver in large quantities are "Comstock Lode," Nevada; Battle district, Montana; Huanchaca, in Bolivia; and Broken Hill, in New South Wales. The enormous quantities of lead and silver raised in the mines at the last-mentioned locality within the last few years have completely revolutionised the market in those metals; it has been a prime factor

in sealing the doom of all but very rich lead mines in the Mother Country.

GOLD.

This mineral is nearly always found in the native state, but occurs also in combination with bismuth and tellurium. We cannot devote much space to it as its uses in the building arts are, naturally, rather restricted. It is found in every possible manner in nature—in veins, beds, and "masses." We gave some idea of its mode of occurrence in irregular ore bodies when dealing with silver. In California, gold is found in a vein of quartz and magnesite running through serpentine and slates. The following diagram (fig. 10) shows the way in which it often occurs in quartz

Fig. 10.

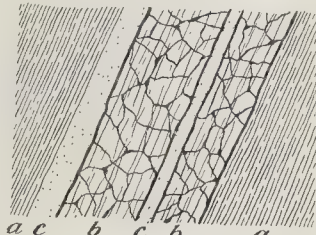


FIG. 10.—Section across an auriferous "quartz reef," Glendhu, Victoria.

a = Grey satin-shales. b = Quartz. c = White. d = Felspathic rock.

"reefs," or veins in Victoria, Australia. Here the reef, about three feet in width, is divided into two parts by a felspathic rock, the gold being disseminated throughout in minute grains and flakes.

Fig. 11 represents a modification of the ordinary quartz reef, as exhibited in one of the mines at Fryer's Creek, in the same colony. In this,

Fig. 11.

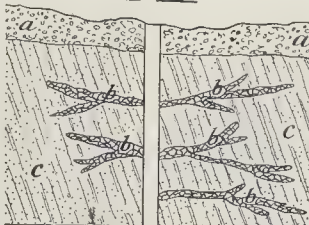


FIG. 11.—Auriferous quartz branching veins, Fryer's Creek, Victoria.

a = Auriferous gully. b = Small quartz veins. c = Sandstone.

small quartz veins (b) from 1 to 3 in. thick only, but highly auriferous, intersect the strata (c) irregularly. After sending out several branches, however, these veins thin out to a mere thread, and ultimately disappear.

In several parts of the world gold is found in alluvial soil and gravels, having been derived from the destruction by denudation of gold-bearing quartz reefs and other kinds of auriferous rock in the same manner as the gravel and sand amongst which it occurs. Such rich alluvial deposits may be traced up the river valley until, perchance, the reef, or rock, from which the precious metal originally came is discovered. Not unfrequently, however, the rock

in situ is covered over by alluvium, or otherwise masked.

Fig. 12 gives a mode of occurrence of gold in the well-known district of Johannesburg, South Africa. The metal is here found in conglomerates which, for the most part, consist of pebbles of white quartz. The greater portion of the gold exists, however, in the cementing material—but very little appearing in the quartz. It is a misnomer to call these conglomerates "reefs," or "veins"; they are true "beds," but we have followed the usual nomenclature as set forth by Mr. Walcott Gibson, who has described the gold-bearing rocks of South Transvaal in much detail, and from whose work the diagram (fig. 12), in a modified form, is taken. The gold-bearing conglomerates (c, e, g, j) are almost vertically disposed.

In Alaska the metal occurs in altered granite, and is worked in the open. A very curious example is constituted by the Mount Morgan Gold deposits near Rockhampton, Queensland. There the ore, which is worked in a quarry, is found in sinter and hematite; some of the rock is spongy, being so light that it will float upon water. The origin of the whole is extremely puzzling, but the Government Geologist for the Colony believes that the sinter, at any rate, has originated by geyser action.

The use of silver and gold in the building trades is limited almost exclusively to ornamental work. Both metals can be beaten out into such thin leaf, being so highly malleable, it is not remarkable that they are especially suited to the purpose. Silver-leaf is applied to non-metallic things by means of some adhesive liquid such as size or gum. In covering metallic objects these latter are heated to remove grease and the surface specially prepared. It may be remarked that aluminium leaf is now to some extent displacing silver-leaf, and there are various substitutes for silvering and gilding in which not a particle of these valuable metals is to be found. Ornamental and plate work is also covered by a thin film of silver by electro-deposition. Silver is such a soft metal that without an alloy of some kind it soon wears away, and a large quantity of so-called silver goods contain much also of the baser metals. Alloys of silver, which we shall describe in their proper place, are of great use from many points of view.

In addition to leaf and thin plates, gold is employed for wash-gilding, a process effected with an amalgam of gold, prepared by dissolving one part of fine gold in eight parts of mercury. Electro-gilding is accomplished by immersing the thoroughly-cleaned articles to be gilded in a solution of gold, connected with a galvanic battery. But we have no intention of writing a dissertation on the art of gilding or gold-plating, and there are many other processes for accomplishing these things than we have indicated.

GENERAL BUILDING NEWS.

SCHOOLS, DUBLIN.—New Catholic schools are being built in Great Brunswick-street, Dublin, for St. Andrew's parish. The total length of the building is 145 ft., and comprises a main block with central projection and wings at the ends, the whole being two stories in height. On each floor there are two schoolrooms 52 ft. by 37 ft. in the main block with class-rooms 33 ft. by 18 ft. in the wings. Entrance-halls, having staircases, include the necessary cloak-rooms. The height of the ground floor story is 15 ft. and the upper story 18 ft., including cove. The upper floors are carried on steel girders. Exhaust ventilators in the roofs and elsewhere are provided to carry off the vitiated air, whilst all the windows are formed with opening compartments in the sashes and fresh-air inlets in the window-seats. The walls are built of Co. Dublin stock-bricks, pointed with quoins and dress-

* "Quart. Journ. Geological Soc.," Vol. XLVIII. (1892), p. 430.

N.

Fig. 12.

S.

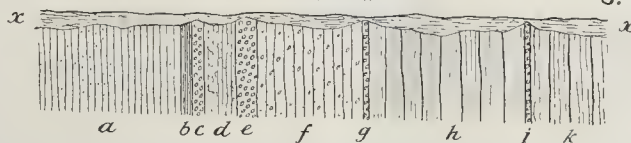


FIG. 12.—Section, Salisbury Gold Mine, near Johannesburg, South Africa.

a = Red, flaggy decomposed sandstone, 30 ft. b = White and blue clay, 6 in. c = Red conglomerate (North reef), 12 ft. to 15 ft. d = Red and white micaceous sandstone, 8 ft. e = Red loose conglomerate (main reef), 12 ft. to 15 ft. f = Fine conglomerate and grit, 24 ft. g = Red conglomerate (main reef leader), 6 in. to 2 ft. h = Coarse compressed grit, 34 ft. i = Red conglomerate (South reef), 6 in. to 2 ft. j = Hard grit. k = Superficial red soil.

* Cf. "Monographs U.S. Geological Surv.," Vol. XX. 899, p. 307; also Vol. VII. (1884).

Christian buildings, suggesting, to some extent, the iconostasis of an Eastern church, with the important difference that it does not intervene between the people and the ordinances. Mr. James Moridis, of Sauchiehall-street, carried out the painting, and Messrs. James Moodie & Son, of Edinburgh and Glasgow, supplied, to the architect's drawings, the wrought-iron and copper coronas.

WINDOW, STOKENCHURCH CHURCH, BUCKS.—The east window of the parish church, Stokenchurch, Bucks, has just been filled with stained glass by Mayer & Co., of Munich and London. The subjects are the Nativity, Crucifixion, and Ascension.

MURAL PAINTINGS, ST. GILES' CHURCH, SOUTH MIMMS, N.—On Sunday last the dedication of two mural paintings took place in St. Giles' Church, South Mimms, N. The work consists of paintings of the Twelve Apostles on gold back-grounds, supported by painted canopies, after the existing work in the church. Each apostle is typified by his attendant symbol as demonstrated on the examples in some of our Norfolk churches. The panels are on thick linoleum, and fixed to the walls by a damp-proof process. The work has been carried out by Messrs. H. G. Bartlett & Co., Brixton.

FOREIGN AND COLONIAL.

FRANCE.—The Ouest Railway Company are about to rebuild the railway bridge which crosses the two arms of the Seine at Bézons, on the Paris and Rouen Railway. At Perpignan, a few days ago, a fine monument was inaugurated to the memory of the soldiers of the Pyrenees Ombudsmen who fell in the Franco-German war. The monument stands at a meeting-point of the Promenades, and is in red marble. The general design is by M. Carbasse, an architect of the Department, and includes a bronze statue of "Revenge," by M. Jean Belloc.—The Fine Art Society of Valenciennes will open its annual exhibition on the 21st, to remain open till October 12th. The Château of Largot, about ten miles from Valenay, is to be put up for sale. It is one of the most remarkable specimens of Medieval military architecture in France.—M. Falguère has been commissioned to execute the statue of Cardinal Laviege, which is to be erected at Bayonne.—MM. Massoules and Dagonet, sculptors, and M. Gillet, architect, have been jointly commissioned to execute the monument to be erected to President Carnot at Châlons-sur-Marne.—The Municipality of Bordeaux are preparing grand fêtes in honour of the Lord Mayor of London, who is shortly to pay a visit to the Exhibition at that city. The Architectural Society of the Gironde and Loire has appointed M. Pinchard, of Macao, as its President for 1895-1896.—M. Perret, of Bourg, and M. Bellefleur, of Lons-le-Saulnier, have been elected Vice-Presidents of the same society.—The death is announced of M. Bonzi, painter, who from 1855 to 1891 was Curator of the Museum at Toulon.—M. Paulin Tasset, a medal engraver of great talent, has been made Chevalier of the Legion of Honour.

GERMANY.—The new Imperial Law Courts at Leipzig will be opened for October 25. The Emperor and the King of Saxony will attend the ceremony. Herr Ludwig Hoffmann is the architect of the building, which has taken about eight years to build, and as a German public building is only second in importance to the Imperial Houses of Parliament at Berlin.—Schliemann's monument at Schwerin was unveiled last week. The monument is in the form of a bronze bust on a granite pedestal, and has been placed near the Pfaffen-Teich. Herr Berwald is the sculptor.—The Berlin University has conferred the honorary degree of a Doctor on "ober Baudirector" Spieker. As we notified some weeks back, Herr Spieker retires from the important office of Architect-in-Chief to the Prussian Commissioners of Works. The distinction is an acknowledgment of the efforts of Herr Spieker to improve the German University buildings, chemical laboratories, and observatories. The Emperor has also conferred a high distinction on the retiring official. Herr Lorenz will be his successor.—A number of the Berlin bridges over the River Spree and the Berlin canals are being rebuilt, and the work will be completed in the opening of the next industrial Exhibition next year. Of the bridges in hand, the "Oberbaum" Bridge, the "Lange" Bridge, and the "Gertrauten" Bridge are the most important.—A large bathing establishment, known as the Bath Club House, has been opened at Berlin under the auspices of a bathing and swimming society. Besides the large swimming-baths for men and women there are Turkish baths and medical baths of every description. Messrs. Ende & Beckmann are the architects, and their work is considered very successful. The swimming-baths have each a water surface of about 500 yards super.—The *Daugetwerks Zeitung* publishes some interesting statistics on the gradual decrease of the building activity in Berlin. It appears that in 1890, 800,000 l. were spent in wages to the building trade in 1891, only 2,000,000 l. were spent in 1894.—The Berlin Press complains of the vandalism of the Government in having temporarily let the old Houses of Parliament a place of amusement and eating-house. The Council Chamber was first used as a kind of restaurant, and now it has been turned into a "model eating-house." The Government might surely have but the building to some other use, especially as

there is a scarcity of office accommodation for the public departments.—The Prussian Minister of Works has decided that an inspection of all the gas and electric fittings in the theatres, music-halls, and assembly-rooms throughout Prussia shall henceforth be made by the Building Act Departments of the cities in which they stand.—Herr Antz is to be the new Cathedral architect at Strassburg. Herr Antz was employed on the St. Stephen's *atelier* at Vienna, and has held other important offices.—A number of improvements are to be carried out in Hanover. Besides the new Town Hall, for the design of which a competition has been opened, there will be a new museum. The wood market is to have some sculptural decoration, for which a competition has also been opened, and the "Marsch" district is to be newly laid out. The Court Theatre is being greatly improved, and a new hydraulic stage is proposed from plans by Herr Brandt, of the Berlin Opera House. The most important of the new works is undoubtedly the proposed Town Hall, which will cost over 200,000 l. The Mayor's parlour and reception-rooms are, alone, to have a superficial area of 900 square yards.

AUSTRIA.—Herr Lichtblau, one of the leading building officials of the Vienna Municipality, has just died at the early age of fifty-three. Besides having attained a very high position in his profession, Herr Lichtblau was exceedingly popular, and kept well in touch with architects of other countries.—The Austrian Government has practically decided on the erection of special hospitals or "homes" for habitual drunkards, instead of reserving wards for them in the hospitals.—An Arts and Crafts Museum is to be formed at Budapest under the auspices of the Hungarian Government, and the custodian of the Hungarian National Gallery has been sent to Italy to purchase some works to start the collection with. The preliminary vote for this purpose is 35,000 l.—In connexion with the completion of the Hofburg Palace front, looking towards Michael's Place, two new fountains are being erected, and have been designed as to lean against the new facade. Professors Wehr and Hellner respectively hold the commissions for carrying out these fountains.—The Royal Commission which has the control of the whole of the improvements which are being made at Vienna had a meeting on the 30th ult., at which a number of important questions were decided. Among these we notice that in order to economise instructions have been given to reduce the proposed expenditure on the architectural rendering of the new metropolitan railway stations. The decoration of these stations is to be subject to the amounts, if any, voluntarily collected by adjoining owners for their beautification. We trust that the Viennese will respond to the call, and not have their city spoilt on account of the economical policy of the Royal Commission. It is of interest to note that nearly 5,000 men are already employed on the improvements.

RUSSIA.—St. Petersburg is to have a new museum and picture-gallery, which will be known as the "Alexandra III. Museum." The deceased Czar had a scheme prepared for this museum, and we are pleased to see that the Emperor Nicholas intends carrying out his deceased father's ideas. The museum will be essentially a national one, only containing works by Russian artists. The collections will be arranged in the Michael Palace, which has been bought out of the funds of the Privy Purse from the municipality of St. Petersburg. The Grand Duke Michailowitch will temporarily have charge of the museum, and be responsible for its arrangement.—No steps have, however, yet been taken by the new Czar to carry out the Opera-house which Alexandra III. had intended to erect, but we understand that the scheme is still under consideration. The deceased Czar passed the plans shortly before his death, and the works have not yet been started this year. The term of mourning, &c., however, apparently prevents any immediate action being taken for a building of this class. The design passed was by Professor Schroeter, and was recently illustrated in the *Builder*.

MISCELLANEOUS.

BOURNE VALLEY POTTERY, BOURNEMOUTH (Henry Sharp, Jones & Co., Ltd.).—This property was offered by auction on Thursday last week by Messrs. Hankinson & Son, of Bournemouth. The sale was held in the brickmaking house on the premises. The property was eventually sold for 20,000 l., the purchaser being Mr. Fredrick Sharp.

LAND SALE, WEST WORTHING.—Mr. Douglas Young, Colman-street, E.C., on the 29th ult. held a sale of the remaining portion of the Liberator land at West Worthing, which realised nearly 20,000 l.

SMOKE-CONSUMING APPARATUS EXPERIMENT IN EDINBURGH.—A smoke-consuming apparatus, patented by Mr. William McGlashan, consulting engineer and surveyor, Leith, was tested at the Royal Infirmary, Edinburgh, on the 23rd ult. It is a method of consuming smoke in the flues before it can reach the chimney, and it can be applied to existing boilers without any alterations. A tank of crude oil is placed at a given height above the furnace; pipes are led from this tank down to the mouth of the ashpit, thence along the ashpit, passing through the bridge into a chamber. The end of

this pipe is fitted with a brass plug, into which is perforated a small needle hole, through which the oil is forced, by reason of the tank being so much higher. The ordinary pigeon door in the ashpit is opened a little to admit air to mix with the oil, which, in conjunction with the smoke and waste gases, bursts into flame, thus consuming the smoke; hence, instead of the smoke passing along the flues, flame takes its place, which keeps the flues clean, and augments the power of the boiler. Automatic gear is fitted for the purpose of economising the oil as much as possible, and works as follows:—When the fire door is opened for the charging of the furnace with fuel, gear attached to it opens the cock at the tank, which allows the oil to operate at once, and also fills up a glass cylinder to the desired height, this being capable of being altered at will, by moving the piston which is in the cylinder, either up or down as required, thus reducing the consumption to a minimum. Sufficient oil having been expended to consume the smoke, and the fire having become bright, no more oil is used until the next charging of the furnace takes place. In the course of the test the furnaces were fired heavy so as to cause dense smoke to be emitted from the chimney. The apparatus was then applied, which cut off the smoke entirely. The apparatus was then shut off, which allowed the smoke to leave the chimney in volumes. This operation was executed three or eight times out of the once firing of the furnaces, thus showing that the apparatus had quite a command of the smoke.—*The Scotsman*.

AMSTERDAM FIRE CONGRESS.—This gathering, to which we referred last week, will take place from the 24th to 28th inst., and we understand that English architects and engineers are most cordially invited to attend the discussions. We have received a list of the subjects on the agenda paper, and find that the work of Group 3 will be of special interest to architects. The final list of the three groups, with their sub-sections, stands as follows:—*Group 1.*—Fire prevention: storage of inflammable merchandise; construction of ovens, fireplaces, furnaces, chimneys, &c.; spontaneous combustion and its prevention; flash point of petroleum; construction of petroleum lamps and stoves; electric installations; lightning conductors. *Group 2.*—Fire extinction and salvage: organisation of fire service, fire alarm systems, &c., in large and small towns and in villages; employment of water-mains for fire extinguishing; construction of fire-engines and smaller fire appliances; the design and arrangement of the interior of fire stations; means for lessening damage caused by water; organisation of volunteer and paid salvage corps; life-saving apparatus for fire brigade use and self help; organisation of fire service in besieged towns. *Group 3.*—Special building construction: fire-proof materials and construction; construction of dwellings-houses; construction and interior arrangement of theatres, assembly-halls, hospitals, factories, and workshops; construction of warehouses. The Secretary of the Congress is M. Rieber, 176, Achterburgwal, Amsterdam.

PUBLIC IMPROVEMENTS IN NEWCASTLE.—The improvements involved in the widening of Gallowgate, says the *Newcastle Chronicle*, are progressing rapidly, and already the thoroughfare presents an appearance completely different from that of a few months ago. The new baths and washhouses are well forward. On one side are the new workshops of Messrs. S. & C. W. Dixon & Co., and on the other a range of buildings is being erected by Mr. H. B. Wilson. Thus Gallowgate seems likely, with its station in Blackett-street, to form one of the best thoroughfares in the city. Other public buildings are advancing quickly. The new branch library, which the Mayor (Alderman Stephenson) has provided in Elswick-road, will, it appears, be completed and handed over to the Corporation within a week or two. The new police-station in Scotswood-road is also nearing completion; and the School Board has building operations going on in various parts of the city. There is a Presbyterian church building in Elswick-road, and another in Northumberland-road. Near the latter building is the hall which the Northumberland miners have built, and which they are to call after the name of Mr. Thomas Burt, M.P. Then there is going on the strengthening of the lighthouse-tower that surmounts the Cathedral of St. Nicholas. The interior of the Theatre Royal in Grey-street has been gutted and remodelled.

SURVEYORSHIP APPOINTMENT.—Mr. J. H. Jevons, Engineer and Surveyor to the Brantree Urban District Council, has been appointed to the Borough Surveyorship of Hertford. There were 122 candidates for the appointment, out of which six were selected to be interviewed by the Council.

VENTILATION OF HOSPITALS.—In the "Sanitary Chronicle" of the Parish of St. Marylebone, for July, Dr. A. Wynter Blyth, commenting on the lack of accommodation in the hospitals of the Metropolitan Asylums Board, says: "It is pretty clear that one of the chief causes of the decrease in the accommodation is the attempt to raise the cubic space per bed from 1,200 to 2,000 cubic feet. It is an acknowledged fact that hospital mortality has a definite relation to cubic space. Beds constantly occupied by patients with a cube of 800 ft. will not give such good results as beds with double that quantity of space, and twice 1,600 may even give still better results, so that you may go on until it comes to putting patients in a hammock under a Japanese umbrella in a field, which would

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premia.	Designs to be delivered.
*Rectory	St. Nicholas (Galway)	100, and 50	Sept. 20
*Sewerage and Water Supply Scheme	Lisulade Parochial Committee	50 guineas & 10 guineas	Oct. 8

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Alterations, &c. Workhouse	Bethnal Green Gnr.	G. E. Holman	Sept. 24
*New Hospital and Reception Wards	Lancashire Asy. Bd.	Stanger & Duckworth	Oct.
*Manservants' Vestry	H. St.		

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Wagons and Carts	Tor, Hay Town Council	H. A. Garrett	Sept. 9
*Scales for Office, &c. Sheffield	Trist, late H. Foster	Fluckton & Gibbs	Sept. 12
*Apparatus, &c. for Glasgow	B. R. Boulter	E. R. Boulter	Sept. 11
*Underground Telephone, &c.	Manchester Corp.	Macfarlane & Co.	Sept. 17
*Wood Paving	Holborn Union	C. B.	Sept. 18
*Alterations, Additions, &c. at Workhouse	Arden School Board	H. S. & J. S.	Sept. 19
*Road Materials	Southgate U.D.C.	Edward Monson	Sept. 20
*Crushed Iron Bulbline	Hendon U.D.C.	S. S. Grimley	Sept. 23

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be received.
*Surveyor and Engineering Assistant	Stockton-on-Tees Corp.	1200	Sept. 9
*Surveyor, &c.	Chippenham U.D.C.	1200	do.
*Inspector of Nuisances	St. Helens Corp.	200	Sept. 16
*County Surveyorship	Civil Service Commn.	200	Sept. 18
*Mechanical Engineer	St. Helens Corp.	200	Sept. 23
*Borough Engineer's Assistant	do.	20	No date
*Draughtsman	do.	20	No date
*Teacher of Woodwork, &c.	Hove and Drington School Board	1000	do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv., vi., viii., and xvii. Public Appointments, p. xvi.

in dry summer weather give the best results of all. It has been noted in more than one epidemic of typhus in Ireland, that those who lay about the fields and on the road-sides recovered, while those who were treated in hospitals and in their own homes died. In hospital construction, however, there must be limit to cubic space; if the cubic space is doubled the expense will be increased in the same proportion, or almost so. It appears to me that the matter is simply a problem in ventilation, and that theoretically it is not an impossibility to keep the atmosphere in a 1,000 ft. cube as sweet and pure as in a 2,000 ft. cube; in other words, that instead of increasing the cubic space, attempts should be made to so improve the ventilation of each bed area and bed space, that the air within is equal in quality to the air without. The majority of the St. Marylebone patients who are sent to hospital have at home not more than 400 cubic ft., and too often something like 200 cubic ft., hence should they be kept at home owing to the want of hospital accommodation, originally mild cases may become fatal, let alone the obvious evil of spread. The Vestry have urged the Asylums Board to utilise to the fullest extent their existing accommodation."

ARCHAEOLOGY IN MADRAS.—Mr. A. Rea, Superintendent, Archaeological Survey, Madras, in submitting a programme of proposed surveying operations for the year 1895-97, proposes to make a tour through the Salem District, and survey any remains which may be found to be of sufficient importance. Among the places which seem to him to require inspection are Krishnagiri, Amaragundi, Kovilvelar, Nangappalli, Omalur, Pottipuram, Salapadi, Taramangulam, Argalur, Attur, Sanku, gudurgam, and Kapiamalai. He also proposes to complete the survey of the great temples at Conjevaram. This programme has been approved by the Government, subject to any orders which may be issued hereafter on the subject of the continuation of Mr. Rea's services after October next.—*Indian and Eastern Engineer.*

FREE LABOUR CONGRESS, NEWCASTLE.—The third annual congress of the National Free Labour Association is to be held at the Geographical Society's Hall, St. Mary's-place, Newcastle-on-Tyne, on October 7 and subsequent days.

LEGAL.

MORDEN COLLEGE v. LETHBRIDGE & PRIOR.

THIS was an action before the Official Referee, Mr. Verey, for dilapidations on property leased by Morden College, which lease expired Michaelmas, 1888. The claim was for 2,000l. The defendants paid 300l. into Court, which they pleaded was sufficient to cover the dilapidations existing at Michaelmas, 1888, having regard to the repairing covenant having the words "the reasonable use and wearing," limiting its force and also taking into account the class and construction of the houses. The hearing was on June 20, 21, 22, 24, and 25, and July 22 and 23 last. Mr. Gore Brown, instructed by Messrs. Reyroux, Phillips, & Co., appeared for Morden College. Messrs. Barnes Williams and Lawton R. Ford were the surveyors supporting the claim.

Mr. Reginald Bray and Mr. Bartley Dennis, instructed by Messrs. Lethbridge & Prior, appeared for the defendants. Professor Banister Fletcher, Mr. H. Phillips Fletcher, and Mr. C. Jones were the surveyors giving evidence for the defendants. The Referee has now given judgment for the defendants with costs.

ALLEGED INTERFERENCE WITH ANCIENT LIGHTS.

THE case of Lewis v. Rookwood came before Mr. Justice Mathew in the Vacation Court on Tuesday last, it being a motion for an injunction to restrain

the defendant from interfering with the plaintiff's ancient lights.

Mr. Hopkinson, who appeared with Mr. Nepean in support of the motion, said that there was no dispute about the lights being ancient. The learned counsel stated that a building was in course of erection by the defendant which had already considerably darkened three ancient lights in the plaintiff's building.

His Lordship: What is said on the other side?

Mr. Marten, Q.C., said that the defendant had submitted plans to the plaintiff nearly a year ago, had modified those plans in accordance with the plaintiff's suggestions, had dug the foundations as long ago as last April, and the building had got up to a considerable height before any action was taken by the plaintiff. By the communications which took place between the parties, it was agreed that the defendant should go on with his building in the way he had done. Whatever the result of the case might be, there ought to be no damages.

His Lordship: I cannot dispose of the case that way. What do you arrange meanwhile?

Mr. Hopkinson: I must say that my learned friend's statement is not in accordance with the evidence.

Mr. Marten said that he was willing to submit to an undertaking to "pull down" after the trial, if so ordered.

After some further discussion, on the defendant giving an undertaking to "pull down" if ordered to do so at the trial, his Lordship made no order on the motion, except that the costs were to be costs of the action.

BUILDING DISPUTE IN THE VACATION COURT.

THE case of Rapley v. Clarke came before Mr. Justice Mathew, sitting as Vacation Judge, on Tuesday last, it being an application by the plaintiff for an order directing the defendant to pull down a building which he had erected. Counsel for the plaintiff said that since last week, when the case was before the Court, the defendant had actually and very substantially reduced the height of his building. He (the learned counsel) probably could not, on the facts as they stood, ask his Lordship to go into the matter then. The defendant had sworn that he did not intend to go higher than he had already.

After some discussion it was arranged by consent that his Lordship should grant an injunction restraining the defendant from building any higher than he had done at present till the trial of the action.

Defendant's counsel said that the defendant, in agreeing to those terms, must not be taken as admitting any liability whatever.

MEETINGS.

FRIDAY, SEPTEMBER 6.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castall-Evans, F.I.C., on "Elementary Physics and Chemistry: Mechanical Physics."—11. 8 p.m.
Liverpool Engineering Society.—Visit to the Sunlight Soap-works at Beington.

SATURDAY, SEPTEMBER 7.

Architectural Association.—Visit of the Camera Club to Winchester.

MONDAY, SEPTEMBER 9.

Clerks of Works' Association (Carpenters' Hall).—Monthly meeting, 7.30 p.m.

TUESDAY, SEPTEMBER 10.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castall-Evans on "Elementary Physics and Chemistry: Natural Forces."—11. 8 p.m.

FRIDAY, SEPTEMBER 13.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castall-Evans on "Elementary Physics and Chemistry: the Atmosphere, its Physical Properties."—11. 8 p.m.

SATURDAY, SEPTEMBER 14.

Architectural Association.—Visit to the Vyne, near Basingstoke.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

15,840.—WINDOWS: *W. Garland and another.*—This invention provides means for raising and lowering sash windows without the aid of cords, weights, &c. Two screws are arranged vertically in the window-frame and engage with nuts formed in two arms, which project laterally from the sash. By turning a handle, which is suitably connected by bevel-wheels, the screws are made to act in unison and lower or raise the top or bottom sash as required.

17,499.—COWLS: *F. Woodford.*—In cylindrical revolving cowls of the usual shape, the vertical vanes ordinarily employed are each furnished, in addition, with a lip at the inner edge, so as to afford a larger surface to the action of the wind. The lower part of the revolving body of the cowl is also furnished with a series of outlet-holes, every alternate one of which is provided with a suitably-curved guide-plate.

18,229.—TILES: *J. Peake.*—Relates to an improved appliance for making roofing-tiles of various angles by the use of one moulding-board. Two boards or leaves, suitably bevelled, are connected together by metallic or other hinges, and provided with wooden strips of different shape and thickness, which are adjusted by screws so as to be easily fixed and removed as required for various shapes of tiles.

15,051.—WATER-CLOSETS: *L. Swale.*—This invention deals with an improved siphon-cistern, which dispenses with the unpleasant noise caused by the ordinary siphon-cistern as used for water-closets, &c. The siphon is fixed in the cistern in the usual way, but is fitted, at the bend with a tap and air-pipe, which is carried up above the water-level. The tap is actuated by an arm and ball, so that when the water falls to any required level the tap is turned and air admitted, which breaks the suction and prevents the usual noise caused by air rushing into the pipe. At the foot of the siphon a pipe and valve is connected and arranged to admit water for starting the siphon.

4,532.—WEDGES FOR DOORS AND WINDOWS: *R. Threlfall and another.*—A wedge, chiefly adapted for the bottom of doors, but may also be used for windows. Consists of wedge-shaped piece of steel having two sharp projecting pieces on the bottom side at the thickest end. The top of the wedge is provided with a V-shaped flange. The mode of application will be easily understood.

9,024.—ASPHALTE: *J. Wetherill.*—For filling the joints of sets and pavings an asphalt is formed by adding first sieved fresh slacked lime with pitch, tar, or creosote oil to a boiling state, so as to prevent it from the effects of cold and heat when in use.

11,920.—BRICKS: *H. Sadin.*—Consists in the employment of natural or calcined coal-schist, which is added to the clay in any proportion for the manufacture of bricks.

NEW APPLICATIONS FOR LETTERS PATENT.

AUGUST 19.—15,546, A. Scott, Fire-grate.—15,586, A. Lange, Rotary Brushes for Paperhanging.—15,599, A. Pellet, Ventilating.—15,606, W. Henderson, Horizontal and Vertical Saws.

AUGUST 20.—15,614, W. Mills, Holding Window-sashes and Preventing Shaking thereof.—15,619, Hampton, Jun., Mire-cutter and Corner Cramp Combines.—15,673, L. Baldwin, Sash Lock and Supports.

AUGUST 21.—15,712, W. Cawthorne, Improvements in Locks, Latches, &c., by Weighting the Latch-bolt.—15,753, R. Wagner, Partitions for Use in Tunnels.

AUGUST 22.—15,782, P. Purcell, Doors, Windows, &c.—15,821, J. Abbott, Combined Safety-valve and Water-tap.

AUGUST 23.—15,825, J. Coulthurst, Turn-tables for Turning over Earthenware Sanitary Pipes, &c.

AUGUST 24.—15,897, W. Blaber, Adjustable Comco for Lead and Stoneware.—15,903, D. Griffiths, Working Machine.—15,908, T. Pilkington and E. Bolton, Prevention of Seepage of Use in Tunnels.

SEPT. 1.—15,919, W. Evans, Draught-excluders for Doors.—15,949, E. Wynne, Countersinking Screws for Use in Wood, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

14,464, D. Simpson, Revolving Window-frame.—14,611, W. Craft and F. Mash, Stained Glass.—14,993, E. McKellar, Smoke and Ventilating Cowls.—14,951, A. Asworth, Locks for Desks, Cabinets, &c.—15,016, J. Shull, Revolving Window for Sash Fasteners.—15,061, R. Alliso, Sash Fasteners.—15,599, The Simplex Window Fitting Company, Limited, and P. Daw, Fastenings for Window sashes, &c.

NARBOROUGH.—For the erection of two villa-residences at Narborough, for Mr. Joseph Guy Simpkin, from quantities and under the superintendence of Messrs. Simpson & Harvey, architects and surveyors, Alliance Chambers, Horse-lane-street, Leicester —

J. & M. Heibert	£5,755 0	J. O. Jewsbury	£5,433 0
Hutchinson & Sons	5,530 0	E. Johnson	5,359 0
Samuel Lord	5,500 0	Hallard & Sons, Blaby ..	5,345 0
Chas. Wright	2,462 10		

* Accepted conditionally.

NEWPORT (Isle of Wight). — For constructing precipitating tanks at the Isle of Wight Union. Mr. John I. Barton, engineer, Ryde —

J. Whitewood	£118
O. James, Haven-street, Ryde ..	105

Accepted.

Jewell & Sons, Winchester.

* Accepted.

STANNINGLEY.—For the various trades required in building a new engine-house and engine foundation, raising of weaving-aid road, and other alterations, 1909-1910. Carried out by Mr. J. W. Smith, for the Trustees of the late Samuel Wyle. Mr. John Waugh, C.E., Sundridge Chambers, Bradford —

Engineering Work.

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Hick, Hargreaves, & Co.	2,485	Buckley & Taylor, Oldham ..	1,677
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Point & Wignall	1,577	Wood Bros.	1,570
Coles & Thorn	1,800	Roberts & Co.	1,550
Yate, Marchant, & Mosley ..	1,795	Marsden & Co.	1,400

* Accepted on their guarantee to have engine running by November 1, 1895.

Machinery Work.

J. Laycock	£1,665 11	J. Deacon	£1,457 0
W. Barrand	1,295	G. A. Walker	1,445 0
Humphreys & Moulton	1,630	A. Broxup & Son, Great	
A. Southwaite	1,250 0	Horron	1,325 0
Appleyard Bros.	1,230 0	J. Anstler	1,300 0

Joinery Work.

J. B. Mann	£1,071 15	0	Crabtree & Thornton.	
Appleyard Bros.	970 0	0	Bradford	£800 12 5
Watkinson & Dawson	921 0	0	J. Deacon	745 0 0
J. Moulton & Sons	848 12	0		

J. Butler & Co.	£1,375	0	Taylor & Parsons	0
Clay, Hennipies, & Co.	1,121 11	0	E. & W. H. Haley	0
W. R. Kilton	1 09	0	Bradford	0
J. Bagshaw & Sons	1,083 17	0	J. Cliff & Co.	950 1 0
			Roberts & Co.	891 12 0

Brook, Walker, & Pichers	£11 17	0	J. A. Higginbotham	£103 16 0
R. Townsend	5 9	0	J. E. Bedford, Chapel	
J. Stansfield & Son	1 35	0	Alderton, Leeds	47 0 0
J. Snowden & Son	54 0	0	H. Lindley	450 0 0
			L. Conyers	433 10 0

Plasterers' Work.

Cordingley & Sons	£245 0	0	J. Laman	£268 10 8
J. Laycock & Son	240 0	0	J. Dixon & Co.	247 18 0

Painters' Work.

J. Shuttleworth	£245	0	J. Snowden & Son	£167
J. Butler	118	0	G. K. Smith, Stanningley ..	100
A. Higginbotham	109	0	E. Hutton	80

Slaters' Work.

Hill & Nelson	£254	0	F. Thompson, Stan-	
Pickles Bros.	251	0	ningley	£370 0
			J. Smith	368 10

* Accepted.

TRING.—For the erection of Sunday-school buildings, New Mill, for the trustees. Mr. Wm. Huckle, architect, Tring. Quantities by the architect:—

Henry Flint	£87	0	Ed. Wright	£791
D. Osborn	84	0	H. Finster	743
G. H. Wheeler	53 12	0	J. Honour & Son	71 0
E. Smith & Sons	75	0	(Accepted)	275

WOLVERHAMPTON.—For erecting conservatory for West End Park, the gift of the Floral Fete Committee. Messrs T. H. Mason and T. H. Gibson, architects, Wolverhampton —

Horicultural builder	£23
Total	£1,356

[Architect's estimate, £1,400.]

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THE INDEX, with TITLE-PAGE, for Volume LXVIII. (Jan. to July, 1895) was given as a supplement with the number for July 12.

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47 and 49, ST. ENOCH-SQUARE

The Builder.

VOL. LXIX. No. 2745.

SEPTEMBER 14 1895.

ILLUSTRATIONS.

Galtee Castle, co. Cork.—Messrs. Darbyshire & Smith, Architects.....*Double-Page Photo-Litho.*
Design for Decoration of Morning-room in Wood and Majolica.—By Mr. T. G. C. Formill.....*Double-Page Ink-Photo.*
Norman Doorways in Kent.....*Two Double-Page Ink-Photo's.*

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Account of Concrete Construction in America.

IN the practical application of scientific knowledge, our American cousins are invariably interesting and frequently instructive. Whether we look at the wonderful uses which they have made electricity subserve, or at the gigantic structures of steel and brick which scrape the American sky, we are struck with the energy and inventiveness of the people. Character displays itself in all things as well as great, and it is not surprising, therefore, to find in the comparatively small field of concrete construction much of interest and value. The Americans have taken up the science at the point where we left years ago by Englishmen, and have carried it a step further by so simple a contrivance that one wonders how in the world Englishmen omitted to do it.

Thirty years ago attempts were made to combine wrought-iron and concrete in the construction of floors in such a manner that the properties of the two materials should have full play, the tensile strength of the iron combining with the compressive strength of the concrete to form an economical and theoretically strong construction. Both in France and in England the attempts were made, but, somehow or other, the system never "caught on," and we find, to-day, that it has been superseded by systems which are theoretically less perfect, and which are certainly more costly. Perhaps the experiments made by that clever inventor, Mr. Thaddeus Hyatt, in 1877, tended to throw doubt on the practicability of getting iron and concrete to work in harness together. Certainly his experiments showed that plain bars and rods of iron could not be trusted to do their share of the work, for they were more frequently "pulled through" than broken. Various methods of preventing this drawing of the iron were tried by Mr. Hyatt, including tying up the ends in the case of bars and screwing nuts on the ends in the case of rods, threading cross-rods through the bars, &c.

But when all was said and done, architects tended to adopt the system. The impro-

bability of two such different materials working together in entire concord seems to have been too much for the faith or courage of architects. A few bold spirits, pinning their faith to theory, have employed modifications of the system, and have not suffered for their boldness; but speaking generally it may be said that architects have left the pretty theory severely alone. In Mr. Sutcliffe's book on "Concrete: Its Nature and Uses," which was expanded from a series of articles in our own columns, the subject is considered at some length, but on the whole the literature concerning the matter is very meagre. It has been left for an American to devise a kind of rod, simple and cheap, and yet so formed that, as the most unimaginative architect can see at a glance, it cannot be pulled through the concrete, but must bear its share of the stresses throughout the whole of its length. Mr. Ernest L. Ransome is the ingenious American, and his invention is nothing more than the twisting of a square rod, as shown in Fig. 1.



FIG. 1.—Square Twisted Iron Rod.

Although Mr. Ransome's invention is unknown in England, it is no novelty now in the United States, for it was patented there no less than eleven years ago, and has been used since in all manner of buildings, including the Leland Stanford Junior Museum, at Palo Alto, in California, which, says Mr. G. W. Percy, is "probably the largest and most important building in the world constructed entirely of concrete." As the years have passed new patents have been taken out by Mr. Ransome in connexion with his system of construction, so that to-day the Ransome & Smith Company holds nearly thirty patents for concrete-building apparatus, mixing machines, and for the application of the Ransome system to the construction not only of floors, but also of sewers and other conduits, illuminating tiling, facing-concrete, &c. In the short space of one article it will be impossible to describe fully all these inventions, but something may be said of the most important, and of those which are especially interesting to architects and builders.

It is well-known that the tensile strength of cement-mortar and concrete is sometimes

only about one-twentieth of its compressive strength. The average ratio, however, between the two is usually considered to be as one to ten or as one to twelve. Roughly speaking, the ultimate compressive strength of good Portland cement concrete (one cement to four aggregate) may be said to be 2,000 lbs. per square inch, and the tensile strength 180 lbs. A material with such properties is evidently ill-adapted for resisting the transverse stresses which occur in flat floors and beams. No wonder that ingenious men dreamt of the possibility of employing wrought iron (with its tensile strength of 56,000 lbs. per square inch) to eke out the feeble tensile resistance of the concrete. A bar of iron one inch square has as great a resistance to tension as a bar of concrete five or six inches square has to compression. Such are the data. To apply them properly it is essential that the iron and concrete should work together, and this is most surely accomplished by binding the two firmly and equally throughout their length. It is clear that a square twisted iron bar, embedded in fine concrete, is bound to the concrete throughout its length; it cannot be "pulled through," and the concrete can only crack with the elongation of the iron.

The twisting of the iron has, however, another advantage besides that of furnishing an admirable bond with the concrete; it actually hardens the iron and increases its strength. It has long been known that the cold rolling of wrought-iron hardens and strengthens it; that is to say, the iron thus treated will not only resist a greater tensile stress, but also will elongate less before fracture. The tenacity of wire, drawn from iron which has a tensile strength of 25 tons per square inch, may be as much as 35 tons per square inch, a gain of 40 per cent. The twisting of an iron bar has exactly the same effect, and up to a certain limit the more the twists which are given to it per lineal foot, the greater is the increase of strength. Bars of "commercial iron," $\frac{3}{4}$ -in. square, gained 5 per cent. with three-quarters of a twist per foot, 18 per cent. with two-and-a-quarter twists, and 24 per cent. with six twists. Norway iron $\frac{3}{4}$ -in. square with six twists per foot gained 52 per cent.* And this increase of strength is coupled with an increased

* These figures are the results of tests made by Lieutenant Gilmore for the U.S. Government, and by the College of Mechanics of the University of California.

resistance to elongation, a point of great importance when the iron is used in conjunction with such a brittle material as concrete.

The leading idea of the Ransome system of concrete construction is simplicity itself, but a great amount of thought and ingenuity has been displayed in the application of the idea to the scores of purposes for which concrete may be used in buildings. We are all familiar with the Chicago method of embedding steel rails in concrete to form foundations for heavy structures, but in these it is the steel which does the work, while the concrete does little more than protect the steel from rusting. Fig. 2 shows a foundation of concrete and twisted iron, in



FIG. 2.—Foundation of Concrete and Twisted Iron.

which the iron, embedded in the lower part of the foundation (for the projections of the foundations are practically two inverted cantilevers), is calculated to resist the tensile stresses which tend to crack the foundation longitudinally, and the concrete is relied upon to bear the crushing stresses in the upper part of the foundation. It is said that "with twisted bars one inch square, placed 3 in. apart, and concrete of a maximum depth of 5 ft., this foundation would distribute a load of 50 tons per lineal foot, over a width of 30 ft., with safety upon any ground." There need be little fear that the iron bars will rust away and thereby lead to the failure of the foundation. The results alike of experimental tests and of actual experience show that iron is effectually preserved by being embedded in good concrete. Von Emperger has stated that in one case iron rods were quite free from rust after being in concrete for forty years.

The Ransome system of construction is also applied to walls, although, as these are subjected almost solely to compressive stress, the addition of iron is seldom necessary. It is, however, in the parts of buildings subjected to transverse stresses that the system is chiefly used, and, of these, floors are the most important. The consideration of this section of our subject is full of interest, for much sagacity has been employed in working out the details, both theoretical and practical. The simplest form of combined floor is a flat slab of concrete with twisted rods embedded in the lower part. Floors of this kind, but with plain rods or bars instead of twisted, have been occasionally used in

England, but no systematic calculations have been made as to the materials required for different spans and loads. The Ransome & Smith Company has prepared a series of tables giving full particulars of the iron and concrete required for flat floors from 5 ft. to 20 ft. span, and for safe loads of 50, 75, 125, 250, and 500 lbs. per square foot. From these we have prepared the following table, which shows at a glance the details of such floors, calculated to bear a safe load of 125 lbs. per square foot in addition to the weight of the floor. The "depth" of the floor (see column 4) is the distance from the top of the floor to the centre of the iron bars; the "height" (column 5) is the total thickness of the floor, including the concrete below the bars. Quarter-inch auxiliary bars, we may add, are laid at right-angles to the others, about 3 ft. apart.

It will be noticed that the weight of iron in these floors is very little—about 1 lb. per sq. ft. for an 8-ft. span, 2 lbs. for a 14-ft. span, and 3½ lbs. for a 20-ft. span. In most English systems of flooring, iron or steel joists, of more than twice these weights per square foot of flooring, would be used. It must be noted that the iron bars are protected underneath by only a very small thickness of concrete; in no case does this exceed five-eighths of an inch, and in the thinnest floor it is only three-eighths. We cannot help thinking that there is danger of the iron being damaged in a severe fire, even though this bottom layer of concrete is fine and rich in cement. Still, bearing in mind the many experiments on the fire-resistance of Portland-cement concrete, and, especially, remembering the comparative tests made in Berlin on the "Monier" floor (which bears great resemblance to the Ransome system) and on floors containing fire-clay blocks and other contrivances, it would be rash to condemn the Ransome floor without a trial.

The most interesting development of this system is undoubtedly the floor with panelled soffit, shown in fig. 3. Considerable ingenuity has been displayed in designing the temporary wood scaffolding (or "false work" as the Americans call it) on which these floors are constructed. The panels are formed on collapsible boxes, the same width of box (namely 2 ft.) being used for all floors. The contrivances, by means of which the same boxes are used for floors of various depths, and by which the width of a box is eked out to form a wider panel when required, are clever but simple. Economy of labour in fixing and removing the temporary work has evidently been carefully studied. The panels may be of various lengths, say, from 5 ft. to 10 ft., cross rods

and "beams" being introduced between each pair.



FIG. 3.—Section of Floor of Concrete and Twisted Iron, for a span of 16 ft. (See Table II.)

It will be noticed that the floor is practically the ordinary joisted and boarded floor reproduced in other materials. The "beam" of concrete with a twisted iron rod embedded in the lower part, takes the place of the wood joist, while the concrete forming the "thickness" of the floor takes the place of the boards. And just as laths and plaster are used to form the ceilings of wood floors, so wood or metal lathing and plaster, or even plaster without lathing, may be used to form flat ceilings under the concrete floor. Frequently, however, moulds are run around the panels and the floor itself is left to form a coffered ceiling, but this method cannot be recommended, as it will result in a terribly noisy floor. The breadth of the "beams" is made three times the thickness of the bars embedded therein, thus a ½ in. bar would require a beam 1½ in. broad, and an inch bar a beam 3 in. broad. As the boxes are uniformly 24 in. wide, the distance from centre to centre of the "beams" would be in the former case 24 + 1½ = 25½ in., and in the latter 24 + 3 = 27. Tables have been prepared giving full particulars of floors to carry safe loads of 50 to 500 lbs. per square foot over spans varying from 11 to 30 ft., and to carry loads up to 125 lbs. per square foot over spans of 40, 50, and 60 ft. From these tables we have extracted the following figures relating to floors calculated to carry safe loads of 125 lbs. per square foot, re-arranging them so that they may be more easily compared with the figures given in Table I.

We have given the figures for the large spans as an American curiosity, and not with any idea that our readers will ever construct concrete floors nearly 6 ft. thick! The figures for the smaller spans, however, may prove useful. At the California Academy of Sciences, San Francisco, floors of this kind were used, and the architects, Messrs. Percy & Hamilton, state that they have proved entirely satisfactory. "One section," they add, "15 ft. by 22 ft., has been tested with a uniform load of 415 lbs. per square foot, and the load left on one month; the deflection at the center of the 22 ft. space was only ¼ in. We estimate the saving in this construction over the ordinary use of steel beams and hollow tile arches of the same strength, and with similar cement-finished floors on the top, to be 50 cents. per foot, amounting to about 20,000 dols. in the building."

It is interesting to note the difference in weight between the panelled floors given in Table II. and the solid floors given in Table I.; for a 12 ft. span the solid floor weighs about 81 lbs. per square foot, while the other weighs only 25 lbs. This saving of material and of dead weight on walls, pillars, and foundations, is an important consideration.

Great care is taken in the manufacture of the concrete for the Ransome floors. The Portland cement must develop a tensile strength of not less than 350 lbs. per square in. in seven days. The aggregates, it is said, "should be of any of the following substances, which are named about in the order of merit, the first being the best: hard limestone rock, hard clinker brick, hard broken pottery, granite or basalt, hard clinkers, broken flint or other hard rock, gravel. Care should be taken to use neither dirty nor soft clayey rock." The method of preparing and laying the concrete is thus described:—"The aggregates should be broken so as to pass through an inch ring, and the fine

TABLE I.—Flat Floors of Concrete and Twisted Iron, calculated to bear safe loads of 125 lbs. per square foot.

1	2	3	4	5	6	7	8	9
Span in feet.	Size of twisted bars in in. sq.	Distance between bars in in.	"Depth" in in.	"Height" in in.	Approximate weight of floor per sq. ft. in lbs.	Approximate cement per 100 sq. ft. in lbs.	Approximate aggregate per 100 sq. ft. in cub. yds.	Approximate iron per 100 sq. ft. in lbs.
8	1	11	2½	3	16	720	1.08	63
10	1	11	3	3½	42	1,100	1.20	59
12	1	11	4	4½	57	1,440	1.71	108
14	1	11	5	5½	69	1,380	2.07	112
16	1	11	6	6½	81	1,620	2.43	165
18	1	11	7½	8½	99	1,680	2.97	163
20	1	11	8½	10½	111	2,220	3.33	270
22	1	11	10	11½	138	2,760	4.14	270
24	1	11	11½	12½	150	3,000	4.50	320

* See the Builder for July 29, 1893.

TABLE II.—Panelled Floors of Concrete and Twisted Iron calculated to bear safe loads of 125 lbs. per square foot.

1	2	3	4	5	6	7	8	9
Span in feet.	Size of twisted bars in in. sq.	Distance between bars in in.	"Depth" in in.	"Thickness" in in.	Approximate weight of floor per sq. ft. in lbs.	Approximate cement per 100 sq. ft. in lbs.	Approximate aggregate per 100 sq. ft. in cub. yds.	Approximate weight of iron per 100 sq. ft. in lbs.
12	1	11	7½	1½	25	487	.64	91
14	1	11	10	2	28	537	.7	11
16	1	11	8½	2	38	713	.95	165
18	1	11	10½	2	40	760	1.1	11
20	1	11	13½	2	45	834	1.17	11
22	1	11	15	2	60	1,173	1.6	250
24	1	11	22½	2	71	1,490	2	11
26	1	11	21	2	120	2,494	3.3	593
40	1	11	18	2	167	3,258	4.3	11
60	1	11	69½	2	243	4,750	6.2	11

ust removed by washing or screening (washing preferred). In mixing add sufficient water to bring the mass into a stiff, unctuous, viscous condition, and tamp it thoroughly into place. Fill the mould up to the line of the bar with a mixture of one part of cement to three of aggregates not larger than pea, lay the lower iron bars on this mixture and tamp them down into it, then fill up with concrete composed of one part cement and three parts aggregates. . . . It is of vital importance that no stop be made in the placing of the concrete from the time the beam is begun until the 'thickness' of the beam is in place, and a thorough joint is made. The web and the thickness must be one solid piece of homogeneous concrete." These instructions are excellent as far as they go, and will prove useful in laying all kinds of concrete floors in which the concrete has to bear the whole or a considerable share of the load. The nature, size, and cleanliness of aggregates are points which are too often considered of trifling moment. Space forbids us entering upon a description of the application of the Ransome construction to roofs, girders, sewers, pavement-slabs, &c., but we have said enough to show that American ingenuity has succeeded in compelling iron and concrete to work together. The problem which has for so many years been attacked, has at length been solved, if not with theoretical perfection, at all events sufficiently for practical purposes.

NOTES ON IPSWICH.

AFTER a lapse of forty-four years, the British Association have again made the Town of Ipswich the seat of their Congress.

Though, as we have already observed, the place is a comparatively small one for such a meeting, it is not without its advantages. The town itself is very interesting historically, and contains within its confines much to attract the archaeologist and antiquary, and the neighbourhood around presents a matter of interest to many different classes of scientific students.

Of late years the development of Ipswich has been rapid, and since the census of 1841 it has increased by 35 000 inhabitants. As is well known, it stands on the banks of the Orwell, at the junction of the salt and fresh water, fourteen miles from the sea, and vessels of considerable tonnage can be navigated and unladen almost in the heart of the town. Ipswich possesses a long and important history, much of which has never been written. Its name has been a subject of much dispute. It is spelt in old documents "Gypseswich," "Gyppeswic," "Gippeswiz," "Gipwic," "Yppsewiche," "Ippsewiche," and, lastly, "Ipswich"—the reasonable solution being that the "wich" is the Scandinavian *vík*, "a creek," and *Gip*, an individual or family.

Roman remains, pavements, and pottery have been discovered close to the town, and one thousand years ago it was of sufficient importance to attract the avarice of the Danes, and several ravages took place in the ninth and tenth centuries. It was then bounded by a mound and ditch, with palisade on the mound pierced by five gates, and small portions of this fortification still remain.

Money was struck at Ipswich as early as 946. In Richard I.'s reign the inhabitants purchased their freedom, and during John's reign they obtained a charter. From the reign of John to the present time Ipswich has flourished as a trading town, and during the fifteenth and sixteenth centuries was devoted to large weaving manufactures of woollen cloths, which the considerable influx of foreign refugees had stimulated in many parts of Suffolk. This foreign influence is seen in the carvings, &c., of the houses.

In early times the monastic rule was very prevalent in the neighbourhood; one of the first monasteries founded there being that of



Wolsey's College Gate, Ipswich.

the Augustine Black Canons, who, just previously to 1177, founded the Priory of Christchurch, or Holy Trinity, and took the then existing church of Holy Trinity for their Priory worship. This Priory being dissolved in Henry VIII.'s reign, the site was sold eventually to Edmund Withipol, who built, in 1548, the mansion still existing, known as "Christchurch." Another Priory of the same foundation was that of St. Peter and St. Paul, which was given to Wolsey to found his college of St. Mary at Ipswich. The gateway of this latter still exists, and a sketch of it is subjoined. The whole of the college, with the exception of this gate, has disappeared, and no record remains of its size or character. It is supposed that this was not the principal gate, as it opens to the riverside of the site. It is a good specimen of Tudor brickwork, consisting of a richly-moulded doorway with hood-mould over it, above which is a panel of freestone much decayed, bearing the royal arms and supporters in high relief; on either side of this panel are niches for statues, and above the panel a row of quatrefoils. The doorway is flanked by octagonal pilasters, which were carried up and finished with finials, and in between the two flanking pilasters were three other finials springing from bases on the coping of the structure. Wolsey is said to have been born at Ipswich, but his birth-place cannot be pointed out.

The church close to the gate, St. Peter's, is a fine Perpendicular structure with a curious Norman font similar to one in Canterbury. It is worth note that in

excavating in the town ditch a few months ago remains of a very similar font were found.

There are four churches in Ipswich dedicated to St. Mary. St. Mary Key or Quay (Perpendicular) contains amongst other things a large Flemish brass to a merchant named Pounder, one of the finest engraved and enamelled plates in England; also an altar tomb to Henry Tooley (1551), merchant and portman, who was a large benefactor to the town. St. Clements (Perpendicular) contains many brasses and monuments, and is the burial-place of Thomas Eldred, who sailed round the world three times in the sixteenth century. St. Mary's tower was rebuilt twenty-five years ago by Mr. G. C. Bacon, the old church having become decayed. There are some curious brasses in the church, one with the old Ipswich arms. At St. Lawrence (Perpendicular) John Bottold built the new nave in 1461, and John Baldwin the chancel. The latter died in 1449, and his name is quaintly inlaid in the east wall in flints and stonework.

St. Margaret's is one of the most interesting churches in the town. It includes work both of the Decorated and Perpendicular periods, and has a fine hammer-beam roof, which was decorated in colour in the reign of William III., and some good windows, and a font of some interest. The church was originally built in the thirteenth century to accommodate the surplus population of the parish after Holy Trinity Church was taken by the Priory of Holy Trinity. Among the curiosities of this church are an ancient

cope, a stone coffin-lid, and also the tomb of the builder of Christchurch Mansion, before referred to. St. Matthew (Perpendicular) serves a parish which once contained four other churches, all now demolished. The existing church is the largest in the town, if measured by seating accommodation. The font is a fine one, but the interest of the church itself has been much impaired by restoration.

Of the other churches of the town, St. Mary Elms has a picturesque Tudor brick tower, and a fine Norman doorway with an ancient door and ironwork. St. Stephen's is a church which is mentioned in Domesday, but the present church is of Perpendicular date, and no remains of the Norman building are in existence. St. Nicholas (probably built on the site of the old church of St. Michael), is a curious church, mostly of Perpendicular date, but several ancient carved stones of Saxon work are preserved in it, one of them representing the combat of St. Michael and the dragon. Wolsey's father left a bequest to the church for painting the figure of the archangel over the high altar. St. Helen's (Perpendicular), much restored, boasts an old sun-dial over the south porch, with the signs of the zodiac on the plate, and contains also some good monuments. St. Mary Stoke, said to date originally from 970, consisted only of a narrow nave, which now forms the north aisle of the existing church, as it was restored and enlarged in 1872. The churches of Trinity, St. John, St. Michael, and All Saints, are modern buildings.

As most of our readers are aware, one of the most interesting architectural objects in the town is the old house known as "Sparrow's House," in the Butter Market.* This was an old merchant's house, originally in Tudor style; there was a curious hammer-beam roof in a room in the attic, probably used as a chapel. In the interior are several old panelled rooms; one dated 1564, with a fine mantel, inscribed with the names of George and Margaret Copping; another, more elaborate, with the name "J. W. Sparrow," and the date 1603. The exterior was re-fronted, plastered, and ornamented in the reign of Charles II.; the parge-work of this front is well-known as one of the most effective specimens in England, though the details are but rudely executed. Among other things of interest in the interior are some fine Dutch tile panels representing Mars and Pallas.

Christchurch mansion, built, as already observed, by Edward Withipol in 1548, is a quadrangular brick edifice, plain, but well-proportioned, with curved gables. After the Withipols died out it came into possession of the Herefords, and in 1734 became the property of the Fonnereau's, a Huguenot family. It is now the property of the Corporation of Ipswich. In the interior some panelling of Georgian date, and some curious wall-papers, are worth attention. Among other things to be seen in Northgate-street is "Pykenham's Gate," the entrance-gate to a mansion, with a porter's lodge over it, built in brickwork, by William Pykenham, in 1471. On the inner side it is half-timbered and has a curious small corner post.

The carved corner posts of Ipswich form a special feature of the town; there are nine of them still remaining; they have been specially illustrated in a volume of drawings by Mr. John S. Corder, of Ipswich; one of his drawings was reproduced in our issue for October 18, 1890, in illustration of a notice of the book.

In Silent-street and Cox-lane are to be seen some elaborate fifteenth-century traceried panels, and similar work is to be found in Soane-street and Bell-lane; in Foundation-street is the old "Fox and Goose," with a satirical carved panel; in Oak-lane is a fine Elizabethan carving representing a smith working a horse-shoe on the anvil. There are some fine old timber houses to be

seen in Fore-street, St. Clement's (including the house of Eldred the explorer), and also in the neighbourhood of the Quay, where the principal merchants lived. At Mr. Murrell's, in St. Peter's-street, is a splendid specimen of a Jacobean plaster ceiling. Carved woodwork of various degrees of excellence is to be found on many houses besides those already mentioned, including a beautiful Gothic barge-board on a house in Turret-lane. The "Old Neptune Inn" is well worth a visit; it contains a room entirely lined with "linen-pattern" panelling, and several other features of interest.

Having given some brief account of the objects of archaeological interest in the town, we may add a few words respecting a subject which will perhaps be of more interest to the scientific visitors to Ipswich—namely, the geological characteristics of the site and its neighbourhood. When geology was in its infancy the numerous fossils found in the locality at Sutton, Butley, Walton, Woodbridge, and nearer Ipswich itself attracted considerable attention. It was recognised in the earlier part of the present century that so far as the molluscan remains were concerned the majority of them were identical with species now living in the adjacent sea; others had their nearest living analogues in the Mediterranean, and later on, when these mollusca were studied in greater detail, it was ascertained that a few of them were extinct. A review of the whole subject led Sir Chas. Lyell, with the aid of M. Deshayes, the late Mr. Robt. Bell, and others, to found the nomenclature of one of those grand divisions of geological time, Pliocene—a term the significance of which is now recognised throughout the world. In fact, it may be said that had it not been for the prolific yield of fossils by the Craggs (Red and Coralline) in the area, assisted by those of other places in East Anglia, the history of our later geological deposits which have to some extent formed a key to beds of similar age on the Continent and elsewhere must have remained a blank, or at any rate would be very obscure. During the past twenty years certain of the pits in these famous localities have been closed, principally on account of the decay of the coprolite industry. The British Association, however, have, we understand, had some of these re-opened on the present occasion to assist the studies of those interested in Pliocene geology—a circumstance, as we know, that will be taken full advantage of, especially by the foreign geologists present. Of the larger remains found in the district it may be noted that the mastodon (an elephant-like animal), and gigantic whales are the most prominent.

The actual formations represented are, in ascending order: (1) The Chalk; (2) Eocene (including the Lower London Tertiaries and London Clay; (3) Pliocene—Coralline and Red Craggs, &c.; (4) Glacial beds; and (5) Post-Glacial. The Chalk and Eocene are not so readily accessible as in other parts of the London basin, and we have already alluded to the great interest centred in the Pliocene of the neighbourhood. The Glacial beds are remarkable as furnishing additional proofs of the very recent existence of Arctic conditions over our islands, and if the actual nature of the deposits did not proclaim their origin and meaning, the few fossils found—nearly all of Arctic genera—would be quite sufficient to do so. The Post-Glacial beds include gravels and brick-earth, found for the most part in the river-valleys.

Students of architecture present will be able to trace the influence of geology in modelling the chief features of the town in regard to its building materials. The deposits in the vicinity have long yielded several kinds of earth suitable for making bricks, and brick-making is one of the staple industries. Nearly all the houses are, therefore, of brick, and where freestone has been employed it was introduced from afar. The gravels and chalk near by have furnished the flints built into the walls here and there. These, and many other points, may be noticed by visitors who care to go into the subject.

BRITISH ASSOCIATION AT IPSWICH.

SIR DOUGLAS GALTON'S Presidential address to the British Association cannot, on the whole, be regarded as very satisfactory. The history of the foundation of the Association is a theme which has been woefully threadbare by former occupants of the chair, and in part also by the Presidents of different sections. It has formed the subject of many a magazine article; and the daily press, times without number, has expatiated upon it as opportunity offered. That portion of the discourse treating "the state of science in 1831" is very superficial, and does not convey anything like an adequate idea of the condition of science at the time. The remainder of the address may be characterised as a miscellaneous and unclassified assortment of facts relating to several sciences, with especial reference to chemistry. Here and there it was prophetic, and "bordered on dreamland." Sanitary engineers are credited with giving us purer water and somewhat purer air than we used to have, as well as having improved the method of sewerage towns. There was much room, however, for the further purification of town air, and the President expressed the opinion that we should suffer from fog so long as we kept refuse stored in our towns to furnish ammonia, or allowed street surfaces to supply dust—of which much consisted of powdered horse-manure—or so long as the products of combustion were sent into the atmosphere. "Therefore," he remarked, "when mechanical traction for vehicles in towns was adopted, one cause of fog would be largely reduced." The dirt from the street, it is true, contributes to the impurification of the atmosphere, but we think it absurd to place this in the front rank; its effects form a comparatively insignificant proportion of the whole of the deleterious matters discharged into the air. In a secondary degree, apparently, was admitted that black smoke from the kitchen was also guilty in this connexion, though the suggestion to use coal instead of coal in our houses with the object of mitigating the fog nuisance can hardly be endorsed as a truly scientific means of dealing with the matter. We very much doubt, moreover, whether the intolerable fumes given off during the combustion of coal would greatly improve the condition of affairs. Sir Douglas Galton states that as long as we retain the open fire in living rooms he despairs of finding a fireplace, however well constructed, which would not be used in such a manner as to cause smoke. This, however, begs the question, and seems to indicate that the learned President has not kept himself abreast of the improvements made in constructing "smokeless" fire-grates in recent years. That some smoke may pass into the atmosphere through such grates goes without saying, but with proper care it may be reduced to the smallest quantity, the effects of which may practically be neglected. The evil would be largely remedied were every fire compelled to consume its own smoke. So long as people fix what kind of fire-grates they please in houses we shall have black fogs with us. Whether compulsion to adopt such grates falls within the range of practical politics remains to be seen. The President paid a fitting tribute to the new branch of investigation which deals with the micro-structure of metals and alloys. This is destined to shed much light on the actual effects of the combination of different metallic substances, and will teach us how to make alloys to possess specific physical properties. The recent improvements in iron production were briefly glanced at, and also their effects in revolutionising the ocean-carrying trade. It is to be regretted that the spirit of the times was not more clearly reflected by adequate allusion to the spread of scientific technology. There is, of course, a danger in compelling science to entirely subordinate itself to the wants of mankind—as over-zealous advocates of

* For illustration and description of Sparrow's House, see the *Builder* for January 30, 1892.

technical education would make it do. All really great scientific discoveries, and those of the most practical character, have had their origin in philosophical conceptions inculcated by pure science. Even the, apparently, most insignificant discovery frequently turns out to be of much practical utility, and we trust the day is far distant when science shall cease to be studied for its own sake. All the same, there has been a general tendency in the past for scientists to be too exclusive, and the circumstance that science has so long been divorced from industry in many departments, must be an excuse for the misdirection of a considerable proportion of the funds now devoted to the purposes of technical education. That much money has been expended during the past few years in the manner indicated was slightly touched on in the course of the address, and we only concur in the observations made. Whatever the merits of the discourse, all must deplore the fact that the President was suddenly taken ill during its delivery, though it is satisfactory to note that he had so far recovered at the end of the meeting to reply to the vote of thanks passed.

NOTES.

HERE can be no question that the recent Trades' Union Congress will be noticeable for something like a real attempt to make these congresses more actually the expressions of the opinions of the actual working men. The Parliamentary Committee, under the authority of the last Congress, altered the standing orders so as to exclude from the Congress persons not actually working at their trades or permanently attached as paid officials to a union. They were also altered so as to prevent Trade Councils from sending delegates, and to give greater voting power to larger unions. On the first day of the Congress a motion was debated that the signing of these new standing orders was beyond the jurisdiction of the Committee, and that they should not be sanctioned till they had been approved by a resolution of the Congress. There can be no doubt that what was really in the minds of the Congress was the discussion took place was whether the Committee had technically exceeded their powers, but whether or not the new standing orders were desirable. The Congress defeated the motion by a large majority, the voting, curiously enough, being in accordance with the Standing Orders which were under discussion. The practical result should be to make the Trades' Union Congress in future much more a meeting of actual working-men and less a debating place where doctrinaires. It is most desirable that working-men should have an opportunity of stating and expressing freely their views in regard to their work and organisation. For the years past these congresses have had very little real importance, and have not shown the views of the mass of intelligent artisans. If the new Standing Orders enable the world to ascertain definitely the views of the great body of English artisans on a limited number of important and pressing questions of the day, the Cardiff Congress will have done a valuable piece of work, and may have laid the foundation for trying on these annual meetings in a more sensible and practical spirit in the future, though the meeting which has just closed has been characterised by as much absurdity and fanaticism as any of its immediate predecessors.

It is to be regretted that Parish Councils have not the power under the Local Government Act to establish and manage, or take over and manage, bathing-places. We believe that the Local Government would have given their opinion on the question. A Parish Council may adopt the Baths and Washhouses Act, but what is needed is something simpler. In many country places

rough bathing-places with sheds and screens can be erected at a small cost, and are very desirable from every point of view. It is just such plain and simple matters as these that a Parish Council can well look after. It would be very easy to amend the Act during next Session so as to enlarge the powers of Parish Councils in this respect, and to allow any expenditure to come out of the ordinary parish rate. It is becoming evident that Parish Councils have next to nothing to do, and they might well be entrusted with the duty of establishing and managing bathing-places or floating swimming-baths. These are very common all over the Continent, but even on the Thames are unknown, with the result that the English boy and man of the artisan class has little or no opportunity of learning to swim.

IN the pages of *L'Architecture* M. Chas. Mesnager calls attention to the threatened destruction of the chapel of the Jesuit Lycée at Rouen. The chapel, of which an interior view is given in connexion with M. Mesnager's letter, is a large one, almost a complete church in its proportions and plan. It is in the rather florid architecture characteristic of the Jesuit buildings of the Renaissance, but it is a building evidently of considerable power and originality of treatment. The piers, formed of clusters of pilasters carrying the usual Renaissance block of entablature, are connected by arches springing out of them at about one-third the height of the pilaster order, and terminating above in a balustrade or panelling level with the pilaster capitals, and carrying their line across. Above this the vaulting arch leaves another open space. The building is probably, as M. Mesnager says, full of faults of decorative detail, but it is most of a striking interior as a whole, and whatever the reason for its proposed demolition (which is not stated) it is to be hoped that the question will be reconsidered.

SOME new premises recently erected in Euston-road, north-side, occupy the site of Messrs. Smart & Co.'s fringe and upholstery factory in Mundy's-yard, standing behind Nos. 268 and 270, which were two shops in alignment with the advanced frontage. On the front of the factory was a bas-relief, being the original, or a replica of it, that was at Coade's "artificial stone" manufactory in Narrow-wall, since Belvedere-row, Lambeth. Croggan & Co., who succeeded to Coade & Seeley at Lambeth, removed to Mundy's-yard, circa 1827, and afterwards to what was then Keppel-row, New-road, where their business passed to Austin & Seeley. Some statuary executed by the firm in the closing years of last century was made from the models and designs of the elder Bacon. In his lecture upon Terra-cotta, delivered at Carpenters' Hall in 1886, and reported in our columns of April 10 of that year, Mr. James Doulton cited many interesting facts concerning the work turned out by this manufactory, which we believe was established by Mrs. Coade, in 1769, at Lyme Regis. He said that the colossal figure of Britannia, on the top of the Liverpool Exchange, the frieze at the Italian Opera House, Haymarket (now pulled down), on the east front, a basso-relievo, by Bubb, of the Progress of Music, and the caryatides with other ornamental work at St. Pancras Church, came from thence.* In 1802 J. Sewell, of Cornhill, published a print, after S. Rawle, of the bas-relief, ascribed to Bacon, over the entrance of the works at Lambeth: a copy of the print is in the Soane Museum. The new premises in the Euston-road, and the adjoining warehouses lately built for a well-known firm of drapers and furniture-makers, stand on the site of an ancient building which in

various old records is styled King John's Palace. Tolmer's-square, at the rear, marks the position of a reservoir belonging to the New River Company. This spot forms part of the background of Hogarth's "March to Finchley," wherein the appearance of men boxing reminds us that the once famous Broughton kept his amphitheatre close by the adjacent Tottenham Court Nursery.

WE observe that in the Staple Inn front of the Patent Office new buildings now being erected for the Office of Works by Mr. B. E. Nightingale, contractor, both the fashion and materials of the contiguous block are being followed. The new extension buildings have a frontage in advance of the old chambers of the Inn which they replace, and stand in alignment with the block on the garden terrace (facing the Hall), which is now occupied by the Patent Office, and was erected in 1843-4, of white Suffolk brick and stone dressings, after the designs of Wigg & Pownall, in the Renaissance style of temp. James I. It was occupied until lately by the Taxing Masters in Chancery, and by the Land Registry. The latter has been transferred to Lincoln's Inn-fields, south-side.

THE sanitary condition of the City of Exeter is the subject of a Report by Dr. W. W. E. Fletcher to the Local Government Board. It appears that for some years past the Board have experienced considerable difficulty in obtaining from the Town Council of Exeter any information as to the sanitary circumstances of that city, and chiefly on this account Dr. Fletcher was commissioned to visit the city and make a special Report. In regard to water supply this is not very satisfactory. The supply was originally by a private company formed in 1833 to supply Exeter with water from the River Exe. The works were extended in 1856, and in 1873 the intake was removed from its position below the junction of the rivers Exe and Culm to its present position some distance above the junction, and about a mile below the village of Bramford Speke. In 1878 the water-works were acquired by the Corporation. The purity of the water is tested by analysis by the public analyst each quarter. The results of these analyses vary considerably, and there are times when the water cannot be considered as of good quality. Besides the village already mentioned, about a mile above the water-intake, there is also, three miles further up stream, the village of Thorverton, containing about 600 inhabitants, the sewage of which passes into a brook, which empties into the Exe. Seven miles further up stream is the outfall from the Tiverton Sewage Farm. At this farm the sewage from the east side of Tiverton, which portion has a population of some 6,500 persons, is said to be dealt with, but at the time of Dr. Fletcher's visit a large volume of untreated sewage was passing directly into the Exe. Other sources of water-pollution are mentioned in the Report. The state of sewage and house drainage is fairly good, though it can only be regarded as in process of reform. But a very bad report is given in regard to the insanitary condition of some of the house property. In the newer parts of the city it may be described as good, and in some parts the dwellings of the artisan class are very comfortable. Every grade of dwelling may be found, from these downward to hovels such as may be seen in the old part of the city near the river. Dr. Fletcher observes that he has never seen in a comparatively small area so many dilapidated, ill-ventilated, badly-lighted, and filthy dwellings as are to be found in this locality. In illustration, he mentions Stephen's-place, West-street, a narrow court containing eight houses, with no through ventilation, and only one water-closet, which was in a filthy state. The houses are unfit for habitation. After mentioning some others equally bad, Dr. Fletcher says: "Victoria Buildings, condemned, and

* To these we may add: trophies of arms at the Tower; the Queen's guard-house, Buckingham Palace; and several barracks in England and Scotland; the arms at the Trinity House; a row of houses, Rochester; and the group of statues, Pelican Life Office, by De Vaare, after Lady Diana Beauclerk's vignettes for an edition of Dryden's "Fables."

very properly so, by the Sanitary Committee, are being repaired, but it is questionable if such repairs should be allowed, seeing there is little air-space. Rather the opportunity should be seized of pulling them down and making an open space. These are only specimens of many similar places. The houses are frequently built of timber and plaster, and are crowded together; very many, although not back-to-back, have no through ventilation, and the houses, like their inmates, are dirty. . . . House accommodation for the lowest of the working classes in Exeter may, in short, be said to be as bad as it can be. The Town Council have erred in allowing repairs where demolition was the only remedy."

WE understand that Mr. Osborne Smith, architect to the Bodleian and the British Museum Libraries, has been instructed to design additional premises for the London Library, St. James's-square. These will be built at an estimated cost of 17,000*l.*, upon the site of some property adjacent, and will contain a reading-room, a committee-room, a students'-room, and staff offices. Established in May, 1841, by the united efforts of Mr. Gladstone, Lord Lytton, Lord Macaulay, Dean Milman, Carlyle, and James Spedding, with others, and opened at No. 49, Pall Mall, the Library was removed December, 1845, to Beauchamp House in St. James's-square, west-side, which had been that of Lord Amherst when Commander-in-Chief. Of that house (shared, until 1874, with the Statistical Society) and of some premises in Duke-street, in the rear, the subscribers bought the freehold, in 1879, for 21,000*l.* But owing to the continued success of the institution the committee find that their existing accommodation is quite inadequate to meet its rapidly increased requirements.

THE letters of the "Silly Season" in the daily papers are an even more plentiful crop than usual, and those correspondents who have taken up the line of meteorological observation have afforded us a curious example of the persistency of a popular fallacy in regard to the method of estimating and describing the apparent size of objects seen in the heavens. In the *Times* of the 6th Mr. A. Warren Melhuish described a meteor which he had seen as "appearing to be" a foot in width; another correspondent who signed himself "E. T.," described one which moved horizontally from east to west, "at 2 ft. (apparent) above the moon." The "apparent" inserted in a parenthesis is evidently regarded as an important concession to scientific accuracy of definition. It would be rather amusing to have an opportunity of cross-examining the writers of such letters as to the data on which they estimate an "apparent" distance of a foot in the sky. One hears such attempts at definition in conversation sometimes, but to meet with this confusion of ideas as to mensuration twice in print in the same column of a newspaper is rather too ridiculous. To say that any object appears a foot or a yard wide is a form of statement which can only be made in regard to what we judge to be the actual size of an object whose distance is approximately known; to give it as the apparent size to the eye of an object whose distance is unknown is merely referring to an arbitrary standard which varies with the fancy of each person; and unless Mr. Melhuish and "E. T." can agree exactly how many feet in circumference the celestial hemisphere "appears" to be, from horizon to horizon, and get the amount fixed by Act of Parliament, their selection of one foot or two feet ("apparent") is mere nonsense. There are two ways of roughly defining the apparent size of an object or a space seen in the sky; either by comparing it with heavenly bodies—*ex. gr.* "E. T." might have said that his meteor passed the moon at so many lunar diameters distance from it; or by

giving the apparent number of degrees occupied in the semi-circle of the sky, which, like every other semi-circle, is supposed to be divided into 180 degrees. In other words, we can only deal in such a case with proportional and relative standards of measurement; a reference to "apparent" lengths of standard linear measurement is a mere delusion of the mind."

CAMPANILE, MADISON SQUARE GARDENS, NEW YORK.

THE Campanile in the Madison Square Gardens is a well-known architectural object, here shown in a new light, as a solitary tower appearing to rise from behind a mass of bare trees in winter. The tower is by Messrs. McKim, Mead, & White, architects, and is modelled after the Giralda at Seville.

MAGAZINES AND REVIEWS.

THE *Art Journal* opens with a descriptive and historical account of the two neighbouring old towns of Rye and Winchelsea, with illustrations from drawings by John Fallowood, R.B.A., which as one might expect, deal rather with the ensemble than the detail of the picturesque features in these relics of old-time prosperity. One would hardly gather, for example, from the sketch of Winchelsea Church that here is some of the best work of the Decorated Period to be found in Kent, whilst of the church at Rye no illustration is furnished, though the description is sufficient to induce any architectural reader to make a note of this as one shrine of pilgrimage at the earliest opportunity. Mr. Joseph Pennell continues his articles on "The Illustration of Books," and the particular division of his subject which he now reaches is of especial interest to our readers, commencing as it does the description of methods of drawing for reproduction in line, and dealing in a clear and comprehensive manner with the technique of pens, ink, and paper. Appreciative articles appear on two painters of diverse character, Telemaco Signorini, the Italian, and Edouard Manet, the Frenchman. Mr. J. M. O'Fallon deals with modern smith's work in an article on "Birmingham Decoratively Wrought Iron," with instances and an interesting description of some of the processes of modern wrought iron working. The examples illustrated are remarkable for intricacy and over-elaboration rather than for restraint or originality, a tendency to which too much latter-day metal work often tends. We are, indeed, forcibly reminded of a piece of work once shown us by one of the firms whose productions are amongst those intanced, which we were informed was the result of a challenge from a workman to the draughtsman of the firm in question that the latter could not design a piece of work which the former could not execute. We seem to be in presence of a constant struggle between designer and craftsman, the one to evolve the other to carry into effect veritable *tour de force* in metal, and as close an approximation as possible to a literal transcription of natural forms, which we need hardly say is a long way from the best traditions of either art or craft. As in ironwork so in linen-weaving, we are presented with what Mr. Lewis F. Day, in his description, rightly calls "A Tour de Force in Damask," an account, with illustrations, of a very remarkable design by Mr. Walter Crane of a cloth for a dinner-table, for which, with full appreciation of its beauty and cleverness, the writer feels almost bound to apologise by insisting that "it is necessary at this date to remind people that a tablecloth may be worth looking at." The notable collection of M. Emile Peyre, by this time, we hope, practically known to all our readers, is the subject of a short article on "Some New National Acquisitions." Some of the more remarkable of the fine collection of pictures belonging to Mr. Merton Russell Coes, Mayor of Bournemouth, are illustrated, with a

* It may be as well to add—lest we should be implicated in starting another popular fallacy—that the word "meteorological," used above to characterise the class of correspondence referred to, does not mean the same as "meteoric," although in the present instance it refers to letters on meteoric appearances.

† The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.

descriptive article, and show a wide catholicity of taste, which is not invariably to be found in the selection of a private art patron.

The painter honoured this month in *The Studio* by a fully-illustrated article is M. Boutet Monvel, whose most characteristic work is probably to be seen in his drawings and portraits entirely typical French children, although his abilities have been by no means confined to such subjects. The recent exhibition of "The Arts and Industries Association at the Albion Hall" is the subject of a wisely critical and well-illustrated article, in which the weaknesses as well as the successes of this well-meaning organisation are treated with judicial discrimination. "Newlyn as a Sketching Ground" is described by one of its habitués, Mr. Frank Richards, and with all due allowance for the enthusiasm of a partisan, presents an attractive and entirely enough prospect. Mr. Arthur Silver's essays on the application of "Stencilled Fabrics for Decorative Wall-Hangings" show the possibilities of such methods, even if there is somewhat too pronounced a mannerism in the treatment of the subjects illustrated, accentuated perchance by the translation into black and white of designs amongst whose principal charms is the gradation of colour which the employment of stencilled dyes admits. The interesting series of articles on the Japanese method of instruction in wood-carving continued.

The *Artist* is chiefly occupied with the annual "National Competition of Schools of Science and Art and Art Classes, 1895," lists of the gold and silver medallists, extracts from the report of the examiners, illustrations of prize medal designs, and a critical article on the work generally filling the bulk of the number.

In the *Essex Review*, Mr. Fred. Chancell, R.I.B.A., continues his "Notes on Essex Churches," and gives an account of the Church of St. John the Apostle and Evangelist, Little Leighs. This is a small church, but contains one of the most interesting monuments in the county, the effigy in oak of a priest in eucharistic vestments, under a richly cusped ogee arch, the spandrels filled with carving, and the hood surmounted by carved crockets, terminating in a boldly-carved finial. The arch rests upon clustered shafts with carved capitals, and the whole is flanked by two buttresses, the pinnacles of which are also richly carved. "The Priory Church of Little Dunmow" is described in an article by Mr. Alfred Hartley, A.R.P.E., whilst those interested in campanology will welcome the continuation of the tabular record of "The Church Bells of Essex."

"Harper contains a highly interesting account of "Notes on Indian Art," by Edwin Lord Vesely, of typical examples of the various schools or styles of Indian architecture, with some excellent illustrations from drawings by the author, including with a brief notice of the School of Art in Bombay and that in Lahore, both of which meet with the writer's approbation, especially their maintenance of the traditions of the indigenous art of India.

Mr. Grant Allen's series of articles on "Evolution in Early Italian Art" is continued in the *Pall Mall Magazine*, and deals with the gradual development of grouping and treatment in the pictures that have the Madonna and Saints for their theme.

In the *Cornhill* is a short article on "The Stone Crusaders," worthy of notice, as making mention of some out-of-the-way examples, scarcely professing, still less achieving, a complete record or even a thoroughly typical selection. Nay, even the title-subject is not strictly adhered to, as part of the short space is occupied by descriptions of so far post-Crusade memorials and monuments of Elizabethan date. "Abbe Amber" gives, in popular form, a fair account of the scientific aspect of this important fossiliferous pine product.

A temperate and well-considered article in *Mucmillan* deals with the relative claims and advantages of "The Nicaragua and Panama Canals," and after a careful examination of the commercial, financial, and political aspects of the question, sums up in favour of the construction of a sea-level canal at Panama, by the joint action and under the joint guarantee of the Great Powers.

The art treasures of Sheffield, or at least those contained in the Mappin Art Gallery, are described in the *Windsor Magazine*, and illustrated by a number of somewhat indifferent illustrations. One variety of bric-à-brac is treated upon in an article on "Some Famous Snuff-boxes," of which the examples illustrated are curious rather than for their esoteric than their intrinsic interest.

Madison Sq. Garden Tower, N.Y.
"A November Sketch."



E. E. Evans



too, in the article on "The Houses of Celebrated People," the instances cited are terribly lacking, on the whole, in architectural merit.

In the *Monde Moderne* is a capital account of the process of iron-casting, and a list of some of the chief foundries of France. In "Deux Petites Capitales Germaniques," we have an enticing description of Luxemburg and Sigmaringen, two of the many picturesque towns of West Central Germany. The paper on Archangel is also of some architectural interest. "La Chalcographie du Musée du Louvre," describes and illustrates some of the finest examples of the great French engravers.

The *Engineering Magazine* deals with "The Architecture of Modern Hospitals," on the text of some of the most recent examples of American work, with plans and views, supplemented for additional interest by illustrations of some Renaissance buildings of Italy, and of Greenwich and St. Thomas's Hospital, which serve as instances of the development of the modern hospital. It is interesting to notice, in view of quite recent expressions of some of our own leading hospital architects, that artificial ventilation by mechanical means is regarded as an uncontroversial necessity for the modern American hospital. The Technical Index is a new feature, which is not without value in these days of high pressure in all departments of intellectual energy. The articles on "Surveying and Mapping a City," and "Revolution in Steel-making," deal with subjects that are of interest, and even importance, to many of our readers.

The *Englishwoman* has a description of York House, St. James's Palace, which, with a little history, is mainly composed of a running catalogue of the furniture and knick-knacks that go to furnish the home of the Duke and Duchess of York.

The pictures from *Punch* continue to recall to us the illustrations of the past, with reproductions from the work of Leech, du Maurier, Corbould, and Charles Keene, of whom there is this month an excellent portrait.

ARCHITECTURAL SOCIETIES.

SHEFFIELD ARCHITECTS AND SURVEYORS AND THE LATE TOWN CLERK.—At a meeting of the Council of the Sheffield Society of Architects and Surveyors on the 5th inst., the President, Mr. Charles Hadfield, in the chair, it was unanimously resolved: "That the Council of the Sheffield Society of Architects and Surveyors desire to convey to Mrs. Pye-Smith and her family an expression of their respectful sympathy in the loss which

they have sustained by the death of the late Town Clerk of Sheffield. In all the intercourse between either the Society or its individual members and the late Town Clerk, his communications were characterised by the utmost courtesy, frankness, and reliability, which can now be looked back upon with satisfaction; while the ability and kindness with which he transacted his official duties increased the personal regard which was entertained towards him, enhanced the dignity of the high office which he held, and promoted the honour and success of his native city."

COMPETITIONS.

WESLEYAN CHAPEL, SKELMANTHORPE.—Twelve sets of plans were submitted in competition for this chapel, and after several meetings the trustees selected those sent in by Mr. J. Berry, architect, 9, Queen-street, Huddersfield, who has since been engaged to carry out the work.

Illustrations.

GALTEE CASTLE.

GALTEE CASTLE is situated in co. Cork, about six miles from Mitchelstown, and at the base of the Galtee range of mountains. The present buildings occupy the site of a shooting-box, built by George, Earl of Kingston, in 1823, and occupy a commanding position at the head of a richly-wooded valley. The castle is backed by a deer-forest and wild moorland, the buildings are immediately surrounded by pine-forests, and the view we illustrate looks upon a beautiful valley, through which a trout-stream gently flows on its way to the river.

Galtee Castle is the residence of Mr. Abel Buckley, J.P., and has been built of red rubble stone with limestone dressings, both stones having been procured on the estate. The accommodation consists of an entrance-hall, dining and drawing rooms, boudoir, library, gun-room, and a billiard-room, with open timber roof and lantern light.

The buildings have been erected under one contract by Messrs. Wm. Brown & Son, of Salford; the joiners' work has been made in England, but the contractors have employed Irish masons and bricklayers, and some of the minor trades have been carried out by Irish labour. The Castle has been supplied with the electric light by Messrs. Drake & Gorham, of Westminster, who have secured the motive power

by utilising the stream flowing through the valley. The whole of the works have been carried out under the superintendence of architects, Messrs. Darbyshire & Smith, Manchester.

DESIGN FOR DECORATION.

The design for decoration of a morning room in wood and majolica by Mr. T. G. C. Formelli, is done chiefly to give a clear idea how these two elements of decoration can be employed together in spite of their differing nature. The children's figures holding the festooned fruit, which pass in the angles through the rings, appear against a background of very relief in majolica, so low as to be almost fused with the background of wood to which they are fastened, and thus further uniting the two elements of decoration. Some points of colour and of gold could be introduced on wood, more especially near the outline of the majolica, to diffuse the colour all over the room. The walls are of tapestry, an overhead window being preferable, because the light is regularly distributed and more symmetrically reflected on the majolica all round the room.

NORMAN DOORWAYS IN KENT.

The County of Kent, which has two cathedrals within its boundaries, has long been referred to on account of the important examples of Norman architecture still existing within it, examples which are only equalled and not surpassed by any other in the kingdom.

The village churches in remarkable number present specimens of the architecture of the early date named, which are as important in their character as the rich and elaborate examples in the cathedrals of Canterbury and Rochester. The doorways of Norman churches are almost always remarkable for their beauty and elaborate character, and the twelve specimens which we illustrate from Kent, are capital representative examples. It would be an easy task to multiply the number but much good would hardly result, for examples given may be taken, as specimens of the whole.

Bekesbourne.—This is an interesting doorway in a church of equal interest. The alternation of the enriched zig-zag course with the plain moulding produces a capital effect by contrast.

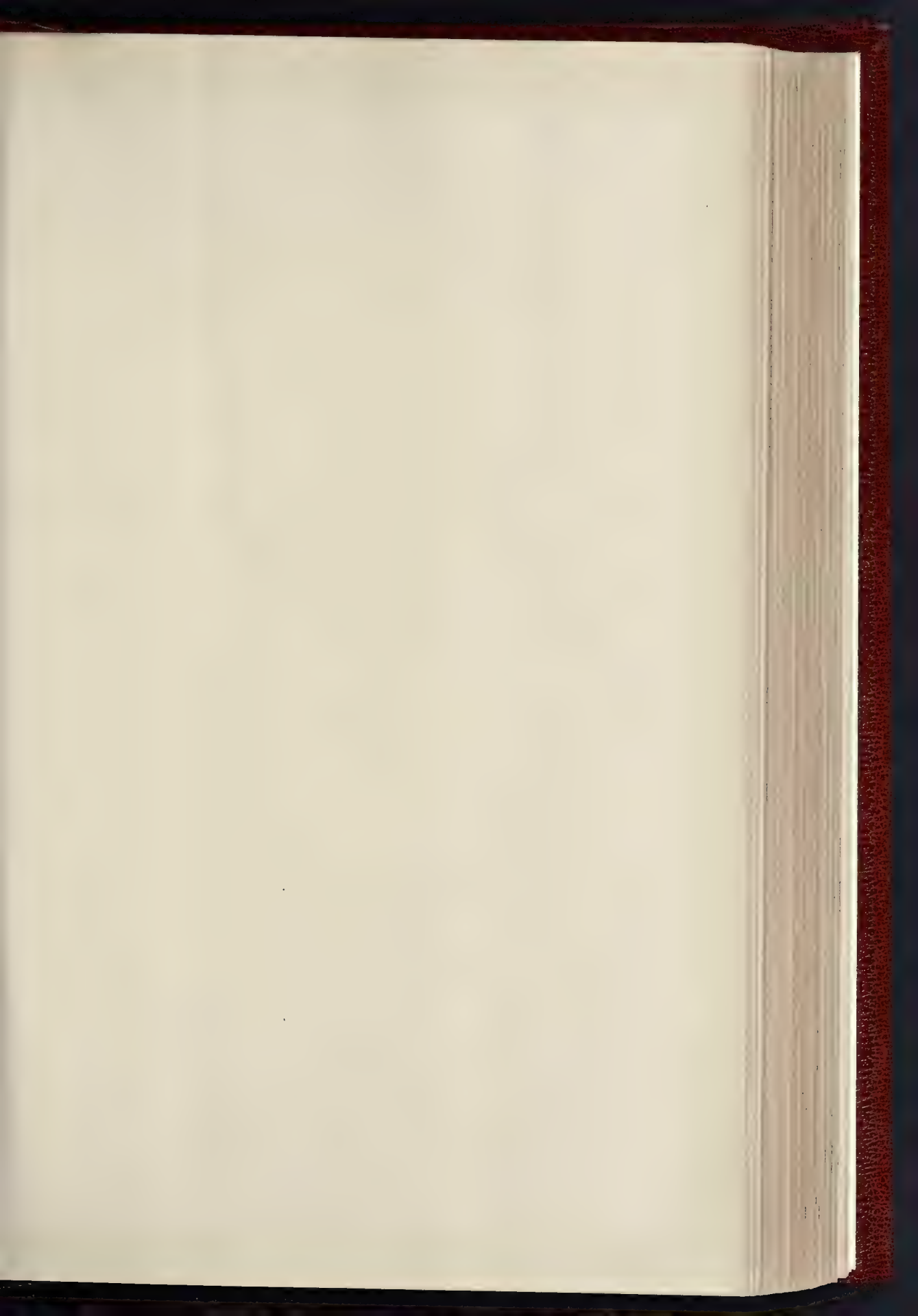
Davington.—The doorway of this church is of late date, as is attested by the star ornament which, in this example, is so prominent as to be the appearance almost of the dog's-tooth moulding of the subsequent style.





*Design for decoration of
morning room in wood
and marble. J. C. Formell.*



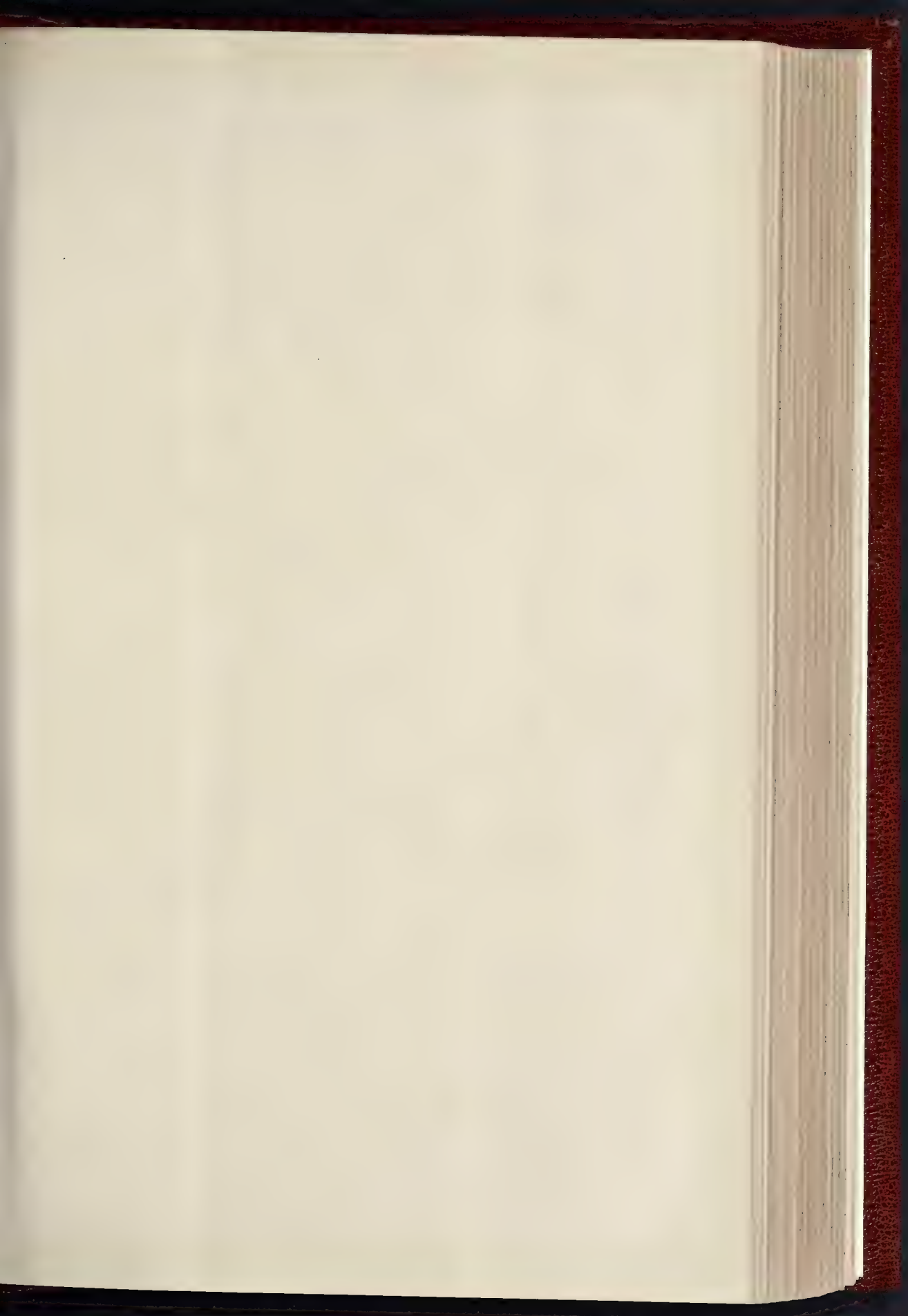




GALTEE CASTLE, CO. CO



PHOTO LITHO SPRAGUE & CO. 48 - EAST HADGING STREET FETTER LANE E.C.





NORTH DOOR, HELESBOURNE



SUPPOSED TO BE THE DOOR THAT BECKETT PASSED THROUGH
TO EAST SIDE, CLOISTERS, CANTERBURY CATHEDRAL



W



W

NORM



ON



WEST DOORWAY, BORDEN.



AK



189. PHOTO SPRAGUE B. C. 4 & 5. EAST WARDEN STREET KETTER LANE E.C.

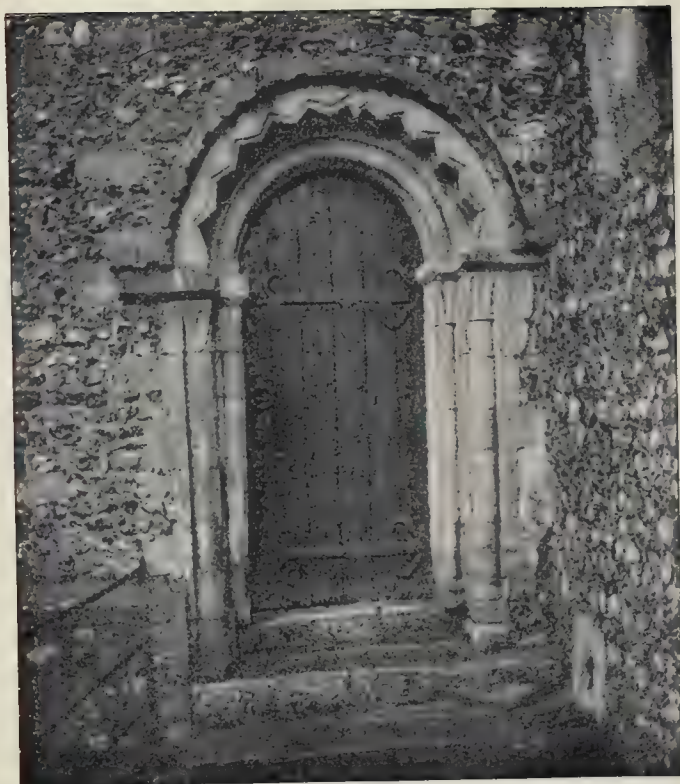
WEST DOOR, BRIDGE.

KENT

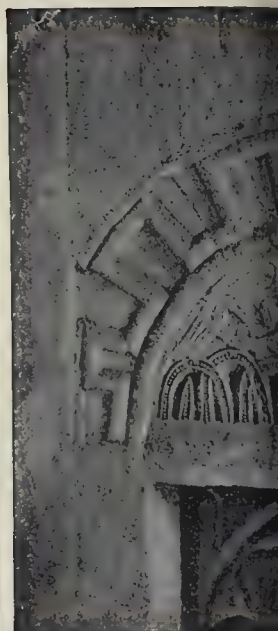




WEST DOOR, ST. STEPHEN'S, CANTERBURY.



OSPRINGE CHANCEL DOOR



TYMPANU

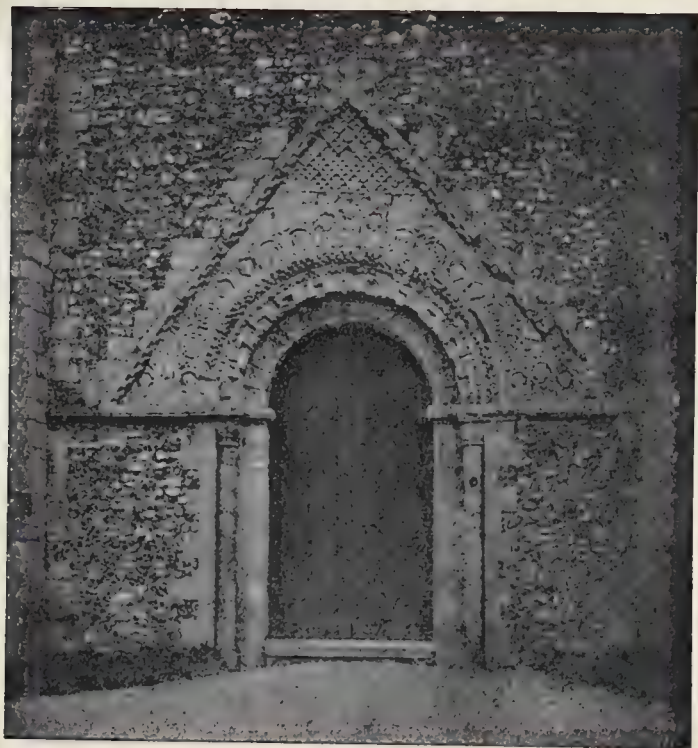


INTERIO

NORMA



NDWICH



WEST DOORWAY, ST. MARGARET-AT-CLIFFE



TSLETT.

KENT



NORTH DOOR, BETTESHANGER.

Borden.—Many examples exist of doorways of similar design to that at Borden. It is of plain character, standing in an external wall, which appears never to have had a protecting porch. The scalloppings of the label indicate a moderately early Norman date.

Canterbury.—This doorway, shown in its restored state, is interesting not only from its associations, but from a curious fragment of the left-hand shaft, which is ornamented with a pattern of interlaced circles very similar to the pattern on the early font of St. Martin's Church. The ornamentation there being later than the font itself. A shattered fragment only remains, and there is still less of the right-hand shaft.

Bredgar is another example of an external doorway without a porch. It will be noticed that the shafts are not worked out of the solid, but are laid on only in the reveals in small stones.

Bridge.—This doorway is a very plain example of a church which is a remarkable study to the classicalist. It should be visited, and its easy transition from Ashford renders it very accessible. It will be noted that the roll moulding is not worked out of the solid, but is only laid on after plan far from uncommon in the county. And the roll moulding continues to exist!

St. Clement, Sandwich.—The tympanum here is very curious and early. The church has quite a grown-in its heavy Norman central tower.

St. Margaret's at Cliffe.—This doorway stands the west front of a remarkable church, which consists of an Early Norman chancel and a large late nave, the tower being at the west end. The work is very good, but the absence of a porch has caused much decay.

Osprey.—This is a small side door in an existing church.

Chislehurst affords an example of an Early Norman doorway now supported on a beam.

Betheshanger.—The north door still retains the all head of original work carved with zig-zag elements, and with a small figure within a niche.

Books.

Light and Air. By BANISTER FLETCHER. Third Edition. E. T. Batsford, 94, High Holborn, W.C.

THIS work on "Light and Air," by Professor Banister Fletcher, is known to most of our readers, and a fair estimate of its just worth has been long ago arrived at. The third edition, to which we now refer, has recently appeared, and may be said to contain, with little, if any, variation, the whole of the matter contained in the second edition, with reports of additional recent cases and diagrams relating thereto at the end. The first of these cases is *Slack v. Richardson and Smyth*, in which the defence is stated distinctly, but not the cause of action. We note, however, that the action referred to is not from an attempt to raise new buildings, and a row of trees which more or less shaded the injured lights. The case could, in our opinion, have been stated in a much more concise form with a little more care. The case of *Baillie v. Campbell* refers to the telling of a story to an old building without the owner raising a complaint, and a successful action then being brought for injury, with compensating verdict and costs. The case of *W. & Co. v. Latimer Clark & Co.* is rare, as a question of air was alone involved. The plaintiffs were timber-merchants, who successfully obtained an action, and obtained a verdict with costs, against the defendants, who had obstructed their drying-sheds by a new building. The case is very recently recorded. The author includes his reference to recent cases by quoting *W. v. the London School Board*. The known text-books of Professor Banister Fletcher are amply padded with a personal element, which adds to the reader's amusement, though it does not increase the book's scientific value. "Surely," the author remarks in his preface, "with these added advantages, this is still continue to be the accepted text-book on the subject."

Practical Surveying: a Treatise upon Surveying. By THOMAS HOLLOWAY. Second Edition. Horace Cox, Bream's-buildings, E.C. 4.

A useful little book on land-surveying in town and country, by Mr. Thomas Holloway, has been revised and is now in the second edition, which we before us. Mr. Holloway evidently has

an intimate knowledge of the subject of which he treats, and lays his knowledge before his readers in a plain, straightforward, and practical way which cannot be misunderstood by the youngest student to whom he appeals, and the plentiful use of diagrams contributes to this end. Mr. Holloway's book is essentially an elementary treatise on the subject, and the author refrains from dealing with the more intricate scientific instruments for surveying, and recommends the student to resort to an experienced surveyor for a lesson with the instrument before him. Those who are acquainted with surveying instruments will recognise the wisdom of the advice. This is a reliable elementary treatise within the reach of all students of the subject; it will also be a useful addition to the library of an architect who is not constantly engaged in land surveys, but to whom a certain knowledge of the subject is indispensable.

Practical Guide to Sanitary Legislation. By J. A. ANGELL and J. G. MORLEY. London: 1895.

PRACTICAL sanitary legislation may be said to date from the passing of the Public Health Act, 1848, which was the fruit of the famous Health of Towns Commission, whose first report appeared in 1844. Although tardy in its start, it made rapid progress, and between 1844 and 1875 more than seventy Acts of Parliament were passed dealing directly or indirectly with the subject. The confused and intricate state of the law under these circumstances may be imagined, and the feeling of relief was general when, in 1875, Parliament saw its way to consolidate the unwieldy mass of statutes by the Public Health Act, 1875, which, however, did not include the Metropolitan within its scope. London in 1891, however, obtained a Public Health Act for itself, very similar in its details to the 1875 Act, but much improved in consequence of the experience obtained from the working of the earlier Act.

The current of sanitary legislation had, however, set in steadily and it became necessary in 1892, for brevity of reference, to pass the "Short Titles Act," which had the effect of including the Public Health Act, 1875, and thirteen subsequent enactments under the comprehensive title of "The Public Health Acts." Matters are now in much the same position as they were immediately preceding the consolidating Act of 1875. We are, therefore, glad to welcome Messrs. Angell and Morley's book, which affords a ready means of reference to a multitude of statutes bearing upon sanitary law, at the same time giving the essential bearing of the sections indicated. In order to render a work of this character useful it must be reliable and accurate in every detail. In fact, like a chain, it must be proved by its weakest link. We have carefully read and compared the work before us, and, avoiding hypercriticism we are pleased to say that it appears to stand the test. We feel sure that it will prove useful to the rapidly increasing number of those interested officially or otherwise in sanitary legislation, and, in view of the probable further consolidation of the legislation in the near future, when this book would become unnecessary, we think that the authors deserve cordial thanks for expending so much ability and labour upon a work, the life of which must of necessity be brief.

The Management of Dynamos. By G. W. LUMMIS-PATERSON. London: Crosby Lockwood & Son. 1895.

THIS book is for the use of mechanics and engineers who have charge of dynamos. It frequently happens, now that dynamo-electric machinery is used in so many works and for such varied purposes, that an apprentice has to undertake the charge of a dynamo without having had much previous experience. He probably gets on very well at first, but soon the dynamo needs some trifling repair, and when it is started again it refuses to excite itself. Finding out what is wrong severely tests the skill with which a young electrician can apply his knowledge. Such a book as this will be of great assistance in helping him; for example, the defects which may give rise to this failure to excite will be found carefully tabulated and the appropriate remedies described.

The first four chapters give an elementary theory of the dynamo; the next four the construction and action of the ordinary forms of dynamos; and in the last four hints are given for their practical management and working. The arrangement of the book is good, and considerable originality of treatment is shown in the latter

part; but a short chapter on the management of alternating-current dynamos would have considerably added to its value.

Correspondence.

To the Editor of THE BUILDER.

ON COMMON COLOURS.

SIR,—I have just returned from abroad, and had my attention directed to Mr. Crace's letter criticising my article. May I begin by saying that it was not my object to recommend any particular pigment to the notice of house-painters, and that I was at some trouble to avoid appearing to do so. I have conducted many experiments on various whites, and have published the results in the *Journal of the Society of Arts*. I am conducting experiments at the present time, and hope to make the results known through the usual scientific channels.

All this is quite apart from the object of my article, which was to direct attention to the importance of systematic scientific research, and scientific instruction in connexion with house-painting.

Mr. Crace's remarks about dyeing and about the unsatisfactory results of applying to the analytical chemist, are confirmations of the view I have taken up.

I did not, in referring to dyeing, mean the discovery of the coal-tar dyes, but wished to direct attention to the results of establishing scientific technical laboratories in this subject. By the researches carried on in the dyeing laboratory of Yorkshire College, Leeds, and elsewhere, the new dyes have been classified as to their properties and durability, and it has been found that by careful selection a far more permanent list of dyes, leading to much greater variety of colour, can be obtained by the modern dyer than could be obtained in the past.

The result, therefore, of careful study in a laboratory with no commercial bias has been to improve the art of dyeing at a time when it might have sunk into unutterable confusion owing to the discovery of so many new dyes.

Now the art of the house-painter is threatened by the same danger, and these same aniline dyes are being used for the manufacture of new pigments, while on every side the ingenuity of modern chemistry is turning out new products which may, or may not, be ultimately found to be improvements. It is therefore of importance that the trade should meet the difficulties caused by the march of invention in the same way.

If Mr. Crace would like a practical suggestion, I should advise that the Painters' Company should go to one of the Polytechnics, either in East or South-East London, and undertake to endow a School of the Chemistry of Pigments, in which not only teaching should be given, of a simple kind suitable for painters, but also systematic research should be carried on into the whole subject, and the information obtained published from time to time in a form accessible to the trade. Such a department would not cost very much to endow, as these Polytechnics already have their chemical laboratories, and in one or two cases are already providing lectures on oils and pigments.

I have found from my own experience that lectures on this subject are not made too difficult there is no trouble in persuading working house-painters to attend them and benefit by them.

I hope I have sufficiently explained my position. I do not desire to give tips through the columns of your paper, but I am anxious to press upon the painting world the necessity of a proper school for the study of the science of pigments and painting.

A. P. LAURIE, M.A., D.S.C.

EAST LONDON WATER SUPPLIES.

SIR,—In reference to a Note in the *Builder* of the 7th inst., on the failure of the East London Water Supplies, I may mention that the last great frost was found to have been the cause of the defective action of the water-pipes to a house in Edinburgh: after the thaw began a considerable leakage and flooding took place into the street cellars used for coal, wood, cases, &c., accompanied with a reddish exudation.

The nuisance was reported to the Water Office, but they declined to take notice, and said it was only surface drainage. By and by, however, other complaints were made in the same street, which induced the Company to excavate and examine their main-pipes there. These were found all decayed, rotten, and covered with red exudation and incrustation inside and outside, and fractured easily with the blow of a mallet. They had been laid down many years since, and were also too superficial and of too small calibre, and no wonder they cracked and leaked after the great frost and thaw of the last winter.

Fresh main-pipes were, therefore, laid down and placed deeper in the street and of larger dimensions, and since then the external leakage into the cellars has disappeared.

As iron pipes evidently were seen to decay much more rapidly than the lead pipes jointed to them,

it is highly probable that in London the main-pipes in the street will be found to be more blameworthy for any leakage than the connected house-pipes. It was further seen that the lead pipes were generally free from incrustation or erosion in the soil of the street, while the iron pipes of any age were eaten away, and covered with the relics of decomposition, both inside and outside. This incrustation may probably have as much weakening influence on the shell of the pipe as the incrustation inside a steam-boiler has upon the strength of its shell when subjected to pressure. Iron water-pipes in the streets would also, therefore, require to be renewed throughout after the lapse of a certain period of years.

"OBSERVER."

ORNAMENTAL PARGETTING.

SIR,—I should be much obliged if any of your readers could give me information as to how ornamental pargetting is produced—such as one sees on the exterior of houses, &c., in many parts of the country.

The ornamentation has apparently been stamped on these, and what I want to know is, how I can obtain the stamps and how to use them. I take it that the work could be done by ordinary plasterers after a little practice.

IGNORAMUS.

The Student's Column.

METALS USED IN BUILDING.—XI.

THE scope of the present series precludes the possibility of our describing in detail the principal non-metals, but in order to fully appreciate the composition and metallurgical effects produced in making alloys it is essential that certain non-metallic substances shall be briefly glanced at. That is the object of this article.

Oxygen.—This element enters into the composition of a vast number of metals and alloys. When substances combine with it they are said to be oxidised; on the other hand, substances which abstract oxygen from a compound are called reducing agents. Oxygen forms the active medium in which bodies burn, and in that sense is the prime supporter of combustion. Oxides are either acid or basic, the former are principally due to combination with non-metals, as in the case of silica or carbonic acid; and the latter chiefly arise from union with the metals. These two kinds when united in equivalent amounts generally have the effect of neutralising each other. A substance may be partially or wholly oxidised, depending on whether the change is complete or not. The particular stage in the oxidation of an ore has material influence on the method of dealing with its reduction or its union with another metal. Oxygen compounds are mostly solid or liquid, but in air this element is in the form of gas. It combines directly with many metals, and some, such as sodium, are compelled to be protected from it, so strong is the affinity between them.

Carbon.—This occurs in three different ways in nature:—(1) in the free state and crystalline, as diamond; (2) scaly, or lumpy, as plumbago and graphite; and (3) powdery or amorphous, as lamp-black and charcoal. *Graphite*, or black-lead, is almost pure carbon, but usually has about five per cent of impurities in the form of clay and iron.

It is found in beds, lenticular and irregular masses in limestones, schist, gneiss, &c. Its numerous applications in the building arts are too well known to need description. *Coal* is a more or less pure form of carbon, depending on its variety and quality. *Bitumen* is essentially a hydro-carbon, and may occur in either the solid or liquid state. *Asphaltum* is a mixture of divers hydro-carbons, all more or less approximating to coal. It is found in large quantity in the well-known pitch-lake of Trinidad; the rock-asphalt of Seyssel and Neuchâtel is a limestone impregnated with from 10 to 14 per cent. of bitumen.

Carbon has so great an affinity for iron that technically-produced iron invariably contains it, though the actual quantity may be infinitesimal. In order to unite the two it is not essential that the iron shall be in a fluid state; that may be accomplished by heating the iron for a sufficiently long period of time in a medium of carbon. The general effect of carbon in iron is, within limits, to increase the tenacity and decrease the ductility; also to cause the metal when suddenly cooled (under certain circumstances) to harden, the hardening being in proportion to the rate of cooling and the amount of carbon present. The maximum quantity of carbon which iron is capable of taking up in the blast furnace, in the absence of manganese, is about $\frac{1}{2}$ per cent. Much carbon renders the pig more or less scaly

in fracture, and the metal then possesses but very little tenacity; as the amount of carbon is decreased, the grain of the iron becomes finer, its colour lighter, and its tenacity greater, but its fluidity when molten is less. Carbon tends to separate in a more or less mechanical, or graphitic form in pig-iron when that metal is heated much above its fusing-point, whereas the same mixture at a lower temperature (though above the fusing-point) would, on cooling, contain it in the combined state.

Carbon, in itself, is such an infusible substance that in the graphitic state it is largely adopted in the manufacture of crucibles; further, it has no tendency to ally itself with substances so as to form fusible slags in the crucible. It may be burned in contact with air. Carbonic acid is a gas which may be produced when carbon is burned in a plentiful supply of air, or in pure oxygen.

Silicon.—This never occurs in a free state in Nature; it is always combined with some other substance, and is largely responsible for the production of acid rocks. Its only known oxide is silica, which occurs in both crystalline and non-crystalline states. This oxide readily combines chemically with different bases, and gives rise to an enormous number of minerals termed silicates, in which are included several valuable ores. Silica plays a prominent part in the reduction of metals from their ores, it being the chief slag-forming substance. The quantity of silicon reduced in a blast-furnace depends on the nature of the flux and on the temperature. The higher the proportion of silica in the cinder the more opportunity is there for reducing, but even from very basic cinders part of the silica is reduced. In combination with iron silicon produces what is known as red-shortness and cold-shortness, and the quantity which may be present, without any decided effect resulting, depends largely on the relative proportion of carbon in the iron. Professor Bloxam has remarked that, with the carbon at 10 per cent., silicon might be present to the extent of '50 or more without causing the metal to be brittle, whereas with about '50 per cent. of carbon the same amount of silicon would cause the metal to be very red- and cold-short. Metal containing much silicon cannot be coated with tin owing to the former becoming oxidised during the operation and forming a protective coating of silica, which prevents the tin from adhering. From the foregoing it will be readily comprehended that under certain circumstances silicon is a very objectionable constituent of steel, yet in the production of sound castings it has proved itself a valuable ally. In combination with copper and tin it forms silicon-bronze, which is applicable for telegraph purposes, and it yields a valuable alloy also with copper alone.

Phosphorus.—The reduction of phosphorus from its compounds is a very easy matter. It is a waxy-looking substance which readily melts and passes off into vapour. Phosphates are decomposed by silica at high temperatures, and in iron it tends to produce cold-shortness. Phosphorus hardens iron to a greater extent than carbon, and, like silicon, the amount of it which may be beneficially used in iron is dependent on the proportion of carbon present. It is objectionable even in very minute quantities in steel for tool-making or cutlery, as the metal can then only be tempered with extreme difficulty; on the other hand, a small proportion is very useful for casting purposes, as the castings are thereby rendered sounder and sharper than would otherwise be the case. This element is an essential constituent of phosphor-bronze, as the latter name implies. Its principal function in that connexion is in refining the bronze rather than to form an alloy with the copper and tin. The physical properties of bronze are also improved by the addition of a little phosphorus. With copper alone it increases the hardness and fusibility of the metal. When present in small quantity it promotes the soundness of castings; though much of it causes the resultant alloy to be brittle. With tin it constitutes the metal known as phosphor-tin.

Sulphur.—This is not a very desirable constituent of most metals, especially certain kinds of steel. It occurs both native and in combination with many metals, forming sulphides; also in the gaseous and liquid states. Its principal home is in the divers volcanic regions of the earth, but much of the sulphur of commerce is procured from the almost universally-diffused copper and iron-pyrites, and from other sources. It is not soluble either in water or alcohol. Sulphur does not produce brittleness in steel, it is objectionable primarily on the ground of its

impairing the soundness of castings. Few kinds of steel contain more than '05 per cent. of sulphur, but even '1 per cent. may be tolerated provided a fair proportion of manganese be present also. Mr. A. Vosmaer states* that, whereas '04 per cent. sulphur renders wrought-iron completely useless, as much as '1 per cent. may be present in steel without interfering with the rolling property, this difference being due to the fact that the former is practically free from manganese, whilst the latter invariably contains that metal. To the same cause may be attributed the property of hard steels to withstand more sulphur than mild ones. But sulphur increases the tendency of steel to rust. The only case where a real sulphide of iron is made use of is in the manufacture of certain cast-iron guns, and that sparingly. In all other cases, so far as iron is concerned, sulphur may be "considered as an impurity whose presence is a necessary evil."

Hydrogen does not generally unite with metals to form compounds, but iron and palladium amongst others, absorb it in considerable quantities.

Nitrogen's prime function in the present connexion is to modify the action of oxygen in the furnace, and in this sense it may be regarded as a nuisance. It neither burns nor supports combustion, passing through the furnace after having assisted to increase the amount of work done therein, without itself having produced any directly-useful results. Of course, this also is a "necessary evil."

Selenium somewhat resembles sulphur in its properties, but is nowhere found in large quantities. It burns in the air with a bright blue flame, and gives off a characteristic odour. In the native state it occurs in cavities among the lavas of Vesuvius and elsewhere. It is also found in combination with silver, lead, copper, &c.

Chlorine is an active chemical agent, and by combining with many different metals forms chlorides. Indirectly it is a powerful oxidiser.

Fluorine, when combined with calcium, forms fluor-spar, which possesses the remarkable property of liquefying earthy substances. It is deservedly in high reputation as a flux.

Boron does not occur native, but as boracic acid, borax, boracite, &c. Borax forms fusible compounds with silica, as well as with nearly all bases, and is extremely useful in uniting with metallic arsenides, oxides, and sulphides. It is practically indispensable in the examination of metals by means of the blow-pipe.

GENERAL BUILDING NEWS.

THE RESTORATION OF OLD MAR CASTLE, BRAEMAR.—Mr. A. Marshall Mackenzie, A.R.S.A., architect, Aberdeen, has been commissioned by Mr. Farquharson of Leverault, to attend to the work of restoration of the interesting and picturesque castle of Mar, Upper Deeside. Operations will be commenced at an early date, with a view to the castle being rendered habitable and let along with the salmon-fishings on the Dee next autumn. The Jacobite rising of 1745 was projected in the castle, and near it was raised the standard of rebellion by the Earl of Mar, as commemorated in the well-known Jacobite song. It is understood that a change will be made on the exterior of the building, which is a prominent and admired object in the valley of the Dee.

ST. CUTHBERT'S COLLEGE, WORKSOP.—Wednesday last week the dedication took place, by the Lord Bishop of Southwell, of St. Cuthbert's College, Worksop. The site of 100 acres on Sparku Hill, about a mile from the old town of Worksop, was given by the Duke of Newcastle, who, five years ago, laid the foundation-stone. The buildings for the western portion of what will eventually be a large closed quadrangle. The collegiate system will be followed at St. Cuthbert's. The internal measurement of the quadrangle will be 170 ft. square, and to its entrance will be gained through the archway, with its porter's lodge, in the middle of the southern side. On the opposite side of the quadrangle will stand the great schoolroom, connected by a range of cloisters with the eastern and western sides. These will contain dormitories for the students, and all the other necessities. To the east will project the chapel. The dining-hall has been already raised. It contains a range of offices, kitchens, buttery, larder, &c., projects towards the west, and is reached through an ante-hall. Like parts of the college, it is a brick structure, with mullions and lancet windows. Internally, it possesses a hammer-beam roof. It is lighted by fourteen wide windows along the southern side, and seven others in the west wall. Externally, the latter appear above a range of five buttresses, as

* "Metals," 1894, p. 18.

* "The Mechanical and other Properties of Iron and Steel," 1891, p. 107.

the former are divided in seven bays with three high-pitched gables, by deep and gabled buttresses. The architects are Messrs. Carpenter & Ingelow. At present the dining-hall, the offices, the west wing, and a portion of the south wing are all that are completed. An illustration of the southern front of the quadrangle and of the southern side of the dining hall appeared in our issue for January 30, 1892.

BOARD SCHOOL, MORLEY, YORKS.—The corner-stones in connexion with the new Board school in Bridge-street, Morley, were laid on the 7th inst., by Councillor C. Scarth. The schools are being built from plans prepared by Messrs. Holton & Fox, Dewsbury. They are designed on the central hall principle, and consist of a mixed school for 688 boys and girls, and an infants school for 550 scholars. The total cost of the schools, not including the site, will be about 8,000l.

RESTORATION OF TOWER, BONVILSTON CHURCH, GLAMORGANSHIRE.—The tower of Bonvilston Church has been taken in hand and the work of restoration has been commenced. The peal of bells will also be re-hung. The work of restoration, &c., has been entrusted to Mr. Charles B. Fowler, architect, of Cardiff, the contractor being Mr. W. A. James, of Cowbridge.

NEW SCHOOL, GOSPEL OAK, TIPTON.—On the 4th inst. seven memorial stones were laid in connexion with the Wesleyan Chapel at Gospel Oak, Tipton. The building will accommodate 275 children. Messrs. Whitehouse Bros., Pimlico End, are the builders. Mr. Edward Pancher, of West Bromwich, is the architect.

MISSION HALL, PERSHORE, WORCESTERSHIRE.—The foundation-stone has just been laid of a Mission Hall at Pershore. Plans were prepared by Mr. W. Lunn, architect, of Malvern, and the contractors are Messrs. Nicholas Brothers, of Pershore. The mission buildings will consist of a main hall, 10 ft. by 24 ft., with an apse at the south end which will form a kind of chancel, and will be screened off; while there will be also provided a class-room and a scullery.

THEATRE ROYAL, GLASGOW.—The Theatre Royal, Glasgow, which, six months ago, was all but totally destroyed by fire, has just been rebuilt and reopened. In the main the former arrangement of the house has been followed in the new building. On the ground-floor there are the stalls and pit; the dress circle and the family circle occupy the first floor, and the second and third floors are respectively the upper circle and gallery. A few of the principal changes on the former theatre are:—The lowering of the roof of the auditorium by some 5 ft. or 16 ft., the lessening of the depth of the stage by 10 ft., and the addition of that space to the proscenium of the pit, the insertion of two proscenium walls between the stage and the auditorium, and the widening of the proscenium itself. Special provision is made to prevent the spread of fire. The two proscenium walls are separated by a space of 10 ft., and the roofs of the auditorium and the stage are completely dis severed. In front of the stage also a re-resisting curtain has been fitted up. In addition to this, water from the mains is laid with hydrants to every floor of the theatre and the stage. The curtain can be lowered in little over half a minute, and is worked by hydraulic power. The stage is 12 ft. in depth, by 72 ft. in width. It is also constructed with very mechanical contrivance, and no gas has been laid on to any part. On either side of the proscenium there are three stage-boxes—one on the stalls level, one on the dress circle level, and another on the upper circle level—flanked by solid Corinthian pillars, which support an arch spanning the proscenium. A gilded frame encloses the stage opening, and in the tympanum of the arch is a decorative painting by Mr. Ballard, London, representing Apollo and the Muses. Springing from the gallery on each side of the theatre is a series of groins leading to the top of the building. The ceiling itself is a circle surrounded by a decorated cornice divided into eight raised ornamental panels. The ceiling, and also the box fronts and proscenium, are made of fibrous plaster by Messrs. Jackson & Sons, of London. The general scheme of colouring is white and gold for the structural parts, and cherry-coloured plush for the hangings and arm rests; while the seats are covered with greenish peacock blue. The back walls the colour adopted is a warm terra-cotta. In the disposition of the accommodation in the auditorium the formerly-existing arrangement has been adhered to. The stalls are, as before, in seven rows, aggregating 170 seats, and the space of 10 ft. taken from the stage is added to the pit, where a departure is made by the provision of cushioned seats. The dress-circle accommodation is 166 seats, and the family-circle 158; and on the upper circle about 200 persons can be seated. The back wall of the circle is arranged in a series of arcades filled in with glass, so that people standing in the corridor may see the stage without going into the auditorium. The pit is seated for about 800, and the gallery for about 800. Altogether 2,000 people will give accommodation to nearly 5,000 people. The crush-rooms, bars, and offices, which were not destroyed by the fire, have been redecorated and refurnished. The lighting of the building is mainly by electricity. Mr. F. C. Phipps, of London, was the architect. The following are the names of the various firms

who have been associated with the construction of the theatre:—Morrison & Mason, Glasgow, general contractors; James Morrison, carpenter and joiner; R. A. McGilvry, plasterer; John Orr & Sons, painters; William Anderson, plumber and gasfitter; W. Meikle & Sons, glaziers; Edward Bell, of London, painting, decorating, and gilding; James Cosgrove & Son, of Glasgow, heating and warming; Strode & Co., sunlight; Claude Hamilton (Limited), of Glasgow, electric lighting; E. & E. Taylor, of London, fire-resisting curtain. Mr. Andrew Cavers has been clerk of works.

BUSINESS PREMISES, SHEFFIELD.—New premises have been erected by Mr. G. H. Hovey at the corner of Angel-street and Castle-street, Sheffield. The new premises have a frontage of 62 ft. to Angel-street and 40 ft. to Castle-street, and they comprise three sets of shops. The building is of brick, with ashlar stone-dressings, and above the fourth floor is a large turret, facing Saig Hill. The building has been erected from the plans and under the superintendence of Messrs. Flockton & Gibbs, architects, Sheffield.

COURT HOUSE EXTENSIONS, SHEFFIELD.—The old Town Hall or Court House, Sheffield, which stands at the corner of Castle-street and Waingate, is now being enlarged. In a short report prepared some months since, Messrs. Flockton & Gibbs, the architects, stated that the new building provides for an additional court 53 ft. by 33 ft., about the same size as the existing large court, and similarly arranged, and furnished in oak; having a large corridor for waiting witnesses, a solicitors' room, and a room for consultation, all on the ground floor, and entered from the far end of the existing ground floor hall. Additional offices will also be provided for the stipendiary magistrates and the magistrates' clerk, and a large room, about the same size as the present grand jury room, will be provided for the magistrates. The magistrates' entrance is to be enlarged and made more important, and will have a suitable entrance-hall and an improved staircase. Under the court there will be twenty lock-up cells for prisoners, and two large cells for prisoners awaiting trial, all in easy communication with the existing and the new courts. A covered van-way passing under the court, and through the building from Waingate to Castle Green, will admit of prisoners being removed from the cells to the prison-van in privacy. The caretaker's house will be in Waingate, with communication to all parts of the building. The ventilating arrangements for the new building provide 3,000 cubic feet of fresh air for each person per hour. The place will be heated by hot-water pipes in the basement, mixed with cold air to the required temperature, and driven by a fan into the court and other rooms. The foul air will be drawn out by another fan. With respect to the cells, the only improvement on the old ones is the substitution of glazed brick surface for white-washed walls. The architects estimate the cost of the new buildings at 17,000l., and the Watch Committee recommended the acceptance of a tender amounting to 15,681l., including building, heating, and lighting, and all the permanent fittings. Access to the new court will be up a short flight of stairs at the further end of the hall. At the top of the steps will be a wide corridor with accommodation for waiting witnesses on one side, and solicitors' and other rooms on the opposite side. In the new court will be space for the general public, not only in the well of the court, but in the Working-street round the room. The walls of the new court will be covered with a blue stone dado, with ornamental blue stone pediments and plaster cornices. The fittings, both in the court, in the various rooms, and in the large corridor leading to the court, will be of oak. In the large hall there will also be marble columns, and a mosaic floor is to be laid. Ashlar stone is being used.

CARDIFF FREE LIBRARY EXTENSIONS.—The rooms of the Cardiff Free Library extension, though sufficiently complete to allow of some of the meetings of the Libraries' Association being held in them this week, are not entirely finished, and the formal opening of the building has been delayed for a short time. The external portion is, however, practically completed, except as to the Working-street front of the old building, which replaces the former front, thus widening the street some 14 ft. The facade of the building in the Hayes contains a colonnade of columns in Portland stone on the first floor, or reference library story. On Saturday last week two seated colossal female figures, flanking the chief entrance in Trinity-street, were unveiled, and in reference to these, Mr. Edwin Seward, the architect, writes that the sculptural and carved work of the buildings has been executed by Mr. William Taylor, representing Mr. W. Clarke, sculptor, of Llandaff. The figures referred to are in single blocks of Portland stone, and they are about one-fourth over life-size. They represent on the left Study, on the right Rhetoric. Above the arched entrance to the building, a new rendering of the heraldry of the Cardiff coat of arms has been carved, the shield being surmounted by the mural coronet, mantled with oak and laurel, and flanked by the maces, which are exactly reproduced from the silver maces belonging to the town of Cardiff. There are two small figures on either hand—the one a reader, and the other a scrivener—which, with flaming braziers, typify Literature and Learning; also emblematised in the arch below by a lamp and torches flanking an open book, in front of which is the Mirror of Truth. In various places in the fronts a feature of some interest has been introduced in the carving—viz., a series of representations of the early marks of the great European printers. Many of these have been supplied from a collection of early specimens of printing and printers' marks formed several years ago by the architect. The series commences with the devices of William Caxton, the first English printer, and his successor, Wynkyn de Worde, on the left and right of the chief entrance respectively. Between these are the serpent and olive branch of Robert Estienne, of Paris, and the Pegasus of Andre Wechel. Further on is the globe of the Elseviers, of Amsterdam and Leyden, and on the angle towards Wharton-street the twin shields and monograms of Fust and Schoeffer (with Gutenberg), the first printers. In the Hayes front are the Aldine anchor and dolphin of Venice; the hand and compasses of Christopher Plantin, of Antwerp, and on the Working-street angle the Adam and Eve of Philippe de Giunta, of Florence. Elsewhere appear the marks of Thomas Vautrollier, Richard Pynson, and John Day. Places have been reserved in the complete portion of the Working-street front for the marks of two Welshmen printers—Richard Jones and another. Most of the carvings above described are in white Portland-stone, but yellow Ham-stone has also been used in places, whilst the whole of the fronts are, otherwise, of Bath-stone from the Combe Down Quarries. The Hayes front is crowned by a colossal bust of Minerva, as goddess of the Arts and Sciences, with the owls as her attributes on either hand. On the pedestal under the bust is an open book. A large tympanum of semicircular shape in the centre of the front contains a bas-relief group, emblematising Literature, the seated female figure of Literature holding a lighted torch, with two Cupidon figures, one inscribing a scroll, and representing Calligraphy with the hour-glass of Time, and the other representing printing by using a pad on a type-frame, and near it the beehive of industry.

CHURCH, YSTRAD RHONDDA.—The corner-stone of a new church for Ystrad Rhondda has just been laid. The church will accommodate 480, and the cost will be 3,000l. The plans, &c., have been prepared by Mr. E. M. Bruce Vaughan, Cardiff, and the contractors are Messrs. A. J. Howell & Co., Cardiff.

SCHOOLS, DUBLIN.—On the 10th inst. the Lord Mayor of Dublin opened the new schools in Aughrim-street. There are three large schoolrooms—one for girls, one for boys, and an infant school, and in addition there are class-rooms, &c. The cost of the building exceeds 4,000l. The architect was Mr. Walter G. Doolin, M.A.

WESLEYAN SUNDAY-SCHOOL, SCARBOROUGH.—On Tuesday the memorial-stones of the new Sunday-school to be built in connexion with the Westborough Wesleyan Chapel were laid. The building is situated at the rear of the present Wesleyan Chapel, Westborough, and fronts to Belle Vue Parade. It will consist of a central hall, 46 ft. by 46 ft., with galleries on three sides, three class-rooms, about 11 ft. by 13 ft. 6 in. each, a young men's room, 24 ft. by 18 ft. 6 in., and a book store on the ground floor, and five class-rooms on the first floor, one 10 ft. by 12 ft., and four about 11 ft. 6 in. by 13 ft. 6 in., which latter will be arranged so as to be thrown into the gallery when needed to add to the accommodation of the central hall. In the basement, lavatory accommodation for both sexes will be provided. The boys' entrance will be on the western and the girls' on the eastern side of the building. Each will have an outer lobby, and an inner lobby communicating with the northern end of the chapel; also staircases giving access to the first floor class-rooms, the gallery of the central hall, and the chapel galleries. There will be a third entrance in Belle Vue Parade communicating directly with the young men's room. The elevations will be of a character to harmonise with the chapel, and outside facings will be buff pressed bricks, with dressings of Cloughton stone. The central hall will have an open wood roof, celled at the collar-beam. The architect is Mr. William Watson, of Wakefield, and the contractors Messrs. Bastiman & Sons for the bricklayers' trades, and plasterers' trades; Mr. Joseph Hargreaves for slating; Mr. George Scales for carpenters' and joiners' work; Messrs. Thomas Craven & Son for plumbing and glazing; Messrs. Appley & Brodgen for ironwork; and Mr. Harry Jackson for painting; all of Scarborough. The contracts amount to 2,500l.

SCHOOLS, DROITWICH.—New schools at Winnett's-lane and at the Holloway, Droitwich, were opened on the 5th inst. by Lord Hampton. These schools have cost 2,600l., with the alterations and additions to the old ones at the Holloway. The architect of the new schools at Winnett's-lane is Mr. Louis Sheppard. The schools are built of red brick and stone facings. The Winnett's-lane school will accommodate 183 infants, and the Holloway schools with the additions 245 boys, 230 girls, and 142 infants. The builders of the Winnett's-lane schools are Messrs. Smallwood, of Wootton Wawen, and of the Holloway, Messrs. Emuss & Harris, Droitwich.

SANITARY AND ENGINEERING NEWS.

SEWERAGE SCHEMES FOR CHESTER-LE-STREET RURAL DISTRICT COUNCIL.—At a meeting of this Council, held on the 5th inst., it was agreed to adopt the recommendation of the Sewerage Committees for two schemes of main sewerage and sewage disposal to be constructed forthwith, in order to meet the requirements of the Local Government Board and Durham County Council, per plans and estimates prepared by Mr. D. Balfour, M.Inst.C.E., of Newcastle-on-Tyne. The first scheme embraces the whole of the villages within the townships of Pelton, Ouston, and Uppeth, also the village of Chester Moor, and the remaining part of the town of Chester-le-Street, with an aggregate population of 19,500, and comprises 20½ miles of main sewers of 24 in., 21 in., 18 in., 15 in., 12 in., and 9 in. fireclay pipes and appurtenances, at a cost of 15,030*l.*; and for sewage disposal works by chemical precipitation and filtration, in conjunction with intermittent land filtration, at a cost of 5,500*l.* The second scheme embraces the whole of the villages within the townships of Washington and Usworth, also the village of Pattisonstown in Barneston township, and Eighton Banks in Lamesley township, as well as houses in a small portion of the town of Gateshead having the watershed to the river Wear, with an aggregate population of 12,500, and comprises 18½ miles of fireclay pipe mains of varying from 21 in. to 9 in. diameter, and appurtenances, at a cost of 73,000*l.* This amount includes outfall subsiding tanks.

SEWAGE OVERFLOW AT WESTMINSTER.—A deputation of tradesmen and residents of Rochester, Westminster, waited upon Mr. de Rutzen, at the Westminster Police Court, on the 9th inst., for his advice as to sewage overflows into the basements of their houses. One of the applicants, a coffee-house keeper, said that on the occasion of one recent storm he had 18 in. of sewage in his kitchens, and the stench was the direct cause of the death of one of his children. He had been obliged to send the remainder of his family away, and no cooking was done. He did not see how he could continue to conduct his business. He and his neighbours had experienced no less than five inundations of sewage in a year and nine months.—Mr. de Rutzen referred the applicants to the sanitary inspector. If they got no satisfaction from him they could renew their complaint.—Further representation was made to Mr. de Rutzen by Rochester-row tradesmen, who expressed as to the annoyance and injury to health from sewage overflows on the occasion of severe storms. A complainant said that the Sanitary Inspector came to his house and had a look round, and the process had been repeated by the Chairman of the Sanitary Committee and the Foreman of Sewers. Nothing, however, in the way of remedy had been attempted.—Mr. de Rutzen said he had already suggested an urgent appeal to the sanitary authorities, and he would send one of the warrant officers to the Vestry Office to state that he was perfectly sure that everything possible would be done to minimise a nuisance of so very serious a nature.

SEWAGE SCHEME, GREAT AYTON, YORKSHIRE.—The Parochial Committee of Great Ayton have awarded the first premium to Mr. Harry W. Taylor, C.E., of Newburn, for his Sewage Disposal scheme, embracing the Universal system (the "Ives" patents), and a loan to carry out the work is to be applied for.

SANITATION AT QUARRY BANK, STAFFORDSHIRE.—A meeting of the Quarry Bank District Council was held on the 10th inst., when Mr. Billingham drew attention to the severe epidemic of typhoid fever, and asked if summonses had been issued against persons who had not closed condemned wells. Mr. Sidaway (Inspector of Nuisances) said the wells had not yet been closed. It lay with the Clerk to summon persons. The Chairman told the Inspector that the orders of the Council were to be enforced and summonses issued. Mr. Smith drew attention to an open sewer between Quarry Bank and Birch Coppice, where the sewage of a great part of the district was carried. A Member: It is nothing more nor less than a death-trap. It was unanimously decided to place pipes in it from top to bottom. The Medical Officer reported a death-rate of 20·57 per 1,000, compared with 18·85 last year. During the month 68 cases of infectious diseases had been notified, viz., 20 fresh cases of typhoid fever, 38 scarlet fever, and one erysipelas. He had made an inspection of the whole of Sheffield-street, and especially with respect to the water supply. He considered that the wells in the district were quite unfit for domestic use. Twelve samples of water had been analysed, and in every case he found the water unfit for drinking. In one instance a cesspool, after rain, emptied itself into the well, and people had to cover up their faces to avoid the sickening effluvia from it. Asbitts he found contaminated with typhoid poison, uncovered, and full of liquid manure. The smell in many cases was simply awful, whilst he also found a well with a tub of pig-swill three yards from it, and no doubt when there was rain this swill washed into the well. In Vine-street he found wells contaminated with organic matter, and these should be closed. There had been fourteen cases of infectious diseases in the hospital, and two patients had died there. The others were recovering. A well near where the first

case of typhoid fever was discovered contained water that was unfit for use. The report was adopted.

WHARF PIER, PLYMOUTH.—The Phoenix Wharf Pier, built on the western shore of the Cattewater, Plymouth, was opened on the 10th inst. by the Mayor of Plymouth (Mr. W. Law). Built of concrete blocks, the structure is 70 ft. long by 45 ft. wide, with a wooden platform projecting beyond the masonry and supported on iron columns. On either side is a long flight of steps, also resting on iron columns. Both these landing-places are carried out into deep water, enabling passengers to land at all states of the tide. The pier is approached from Commercial-road by means of a flight of steps and a gangway, 8 ft. wide, extending a distance of 110 ft., as it is intended chiefly for steamer-traffic. The work has been carried out by Mr. George Shellabear, from the designs of Mr. G. D. Bellamy, Consulting Engineer to the Corporation, and under the supervision of Mr. C. Winnicott, clerk of works.

FOREIGN AND COLONIAL.

FRANCE.—It is announced that the Sultan has promised a contribution of 500,000 francs towards the cost of the new mosque which is to be built in Paris from the designs of M. Saladin.—A new street, which will bear the name of Square de l'Opéra, is to be formed in Paris on the site of the Eden Theatre, which has just been demolished. It will connect with the Boulevard des Capucines.—M. Moreau, the architect, has nearly completed the new abattoir which has been in progress on the left bank of the Seine, to replace the abattoirs of Villejuif and Gravelle. The cost of this great undertaking will probably amount to 12,000,000 francs.—A new church is shortly to be built at Cléchy, to replace the old one, which dated from 1612, and with which St. Vincent de Paul was connected.—The work of restoration is to be commenced next month at the church of Bougival, an important monument, the nave of which dates from the thirteenth century; the bell-tower being still older. Nearly 600,000 francs is to be spent on the work.—The exhibition organised by the Société des Amis des Arts at Aix, in Provence, is to be opened on November 3, to close on the 29th of the same month.—An International Exhibition of Arts and Industries is being organised at Poitiers for the present month. It is held in the blossom Park.—In the process of demolition of the fortifications at Arras an old tower has been discovered of the date of the tenth century, in which, according to tradition, Jeanne d'Arc was confined in 1430.—The town of Toulouse is about to construct a new bridge over the Garonne at Portet.—It is announced that a statue of Gambetta is shortly to be erected at Bordeaux, on the spot formerly occupied by a statue of Napoleon III. In the same city the monument to President Carnot will in a few weeks be erected on the Place Richelieu.—A new hospital is to be erected at Rodez, at a cost of 300,000 francs.—An asylum for convalescents is to be erected at Havre, through the liberality of M. Kerdyck, a wealthy merchant of that town.—The death is announced, at the age of twenty-six, of Alphonse Fassin, Etienne, painter, and also director of the magazine entitled *L'Europe Artistique*.

AUSTRIA.—The Austrian Budget for 1896, which has now been published, gives the professors and tutors of the technical colleges cause for complaint. Whilst there has been some improvement in the salaries of the lower grades of the Government service, the members of the learned professions have not been thought of. There is plenty of room for improvement in engineering and architecture throughout Austria, and one of the ways towards progress will be the retention of first-class masters in the technical institutions.—It has been decided to hold a large agricultural exhibition at Vienna next year. There will be a section for models and plans of architectural buildings, model dairies, &c., and also for hop-kilns, breweries, &c.—The Hungarian Government has decided to construct a winter harbour at Pressburg, on the River Danube. The plans of the new works show that the harbour will have accommodation for eighty tug-boats of 400 tons each. There will be unloading quays with warehouses, &c., and the preliminary work already passed figures at 40,000*l.*—We regret to announce the death of Herr Karl Kayser at the age of fifty-eight. Herr Kayser, who was a well-known figure in the Austrian Art circles, acted as Court Architect to the Emperor Maximilian of Mexico from 1864 to 1867, and was engaged on various restorations, and some places in that country. On his return to Vienna, he held a number of important commissions for town houses, and mansions for the Austrian aristocracy, and also restored many of the historical country seats in the country.—We also regret to record the death of Herr E. Kaiser, the painter, who died at the age of seventy-five. Herr Kaiser was well known in this country, and held commissions, if we remember rightly, for the Arundel Society to copy works of old masters.—The plans of the new central station for the proposed Metropolitan railway at Vienna are now on view at the Town Hall. The lines run in a cutting, and the station will hence also be below the street level.

The site is near the Central Customs Station, and the approaches have been very carefully thought out.—A new pumping-station for the waterworks is to be erected at Vienna at a cost of 25,000*l.*, owing to the insufficiency of the water supply in the higher districts of the city.

AUSTRIAN LIGHT RAILWAYS.—The *Viennese Freie Presse* publishes some interesting particulars, as to the progress of light railways in Austria. The Austrian Parliament sanctioned forty-seven new lines during the last two sessions, and in most cases the authorisation was quickly followed by the commencement of the works in question. There are also some twelve light railways in course of construction for which concessions were obtained at an earlier date. It would lead too far to name the various lines sanctioned, with their cost, &c., but on looking through the lists we find that twenty of these lines are being constructed in Bohemia, and that the average cost of the lines is 200,000*l.*, and that the average length is about fifteen English miles.

MISCELLANEOUS.

WOOD VERSUS ASPHALT PAVEMENTS.—Like the neighbouring parish of Marylebone, the St. Pancras Vestry are substituting wood for granite sets and macadam in remaking the roads, and the cost of the wood is much less than that of the granite. The St. Pancras have now been paved with wood. The hard and non-absorbent woods are now being mainly used. A proposal to pave Francis-street, Tottenham Court-road, with asphalt instead of wood was almost unanimously rejected at the last meeting of the St. Pancras Vestry. Mr. Purches, chairman of the Works Committee, reminding that it had been demonstrated that asphalt pavements were the most slippery and dangerous of all pavements, and it was positive cruelty to horses to use asphalt as road-paving material. Observations of the relative slipperiness of asphalt, granite, and wood had been made in the City during fifty consecutive days at the instance of the City Engineer. During those fifty days 1,066 accidents occurred on asphalt, 719 on granite, and 542 on wood pavement.

YORKSHIRE ARCHEOLOGICAL SOCIETY.—About sixty members of this Society met on the 6th inst. at Nunnington, about four miles from Helmsley. Their first visit was made to the church, which has a history connected with the Earl of Mortimer who was a brother of William the Conqueror, and by whom it probably was founded. There is a very curious tablet in the church to Thomas Jackson, a famous jockey of last century, and which says none, however humble of birth, need despair of glory, such as this said Thomas won at Newmarket. From Nunnington, waggons took the road to the church, with its beautiful screen of the time of Laud, 1637. This is one of the very few in the county which escaped destruction, for strict orders came from Parliament that all were to be destroyed. Canon Greenwell then described the ancient cross in the church, which he dated about the tenth century, and which he said was no doubt a memorial cross to someone. From there the party drove off to Gilling Castle, which has lately been sold by the Fairfax-Cholmeleys to Mr. Wilson, ex-Lord Mayor of York. The dining-room of the castle was described as the most beautiful Elizabethan room in existence, owing to the sumptuous glass that it contains. The day's excursion was under the guidance of Mr. Brown, the Secretary of the Society.—*Leeds Mercury*.

MEMORIAL OBELISKS, HAWICK.—On the 7th inst., at the site of Heilawshiel, on the Cavers estate, a few miles from Hawick, a granite obelisk marking the spot whereon stood the cottage inhabited by the parents of Dr. John Leyden, poet, on the same day a tablet in the wall of the cottage where Leyden was born was uncovered. The sculpture work was executed by Mr. Robert Robson, of Hawick.

TRADE NOTICE.—Mr. A. G. Wright, formerly an ironfounder at Rotherham, and who has been connected with Geo. Wright & Co. and Geo. Wright & Sons, and other London firms, has opened an office at 53, Victoria-street, Westminster, as an engineer and ironfounder.

HADRIAN'S WALL.—The excavations promoted by the Cumberland and Westmoreland Archaeological Society, along the line of Hadrian's Wall, are of very important and have just come to an end. One very important and interesting discovery has been made at Appleton, a vest of the Roman fort of Bidoswald (Amboglanna). It has long been observed that at this spot a deep fosse interposes itself for nearly a mile between the Wall and the Vallum, running roughly parallel to these two works, but finally running into the Wall about a mile and a half from Bidoswald. No one has hitherto been able to explain the existence of this fosse. Usually it has been held to be a "first shot" for the line of the Wall, afterwards altered. It has now been made certain that this fosse is the ditch in front of a turf-wall, built like the Vallum of Antoninus in Scotland, of regularly laid sods, and extending probably the whole length of the ditch. This is the first trace yet found of a turf-wall along the English Wall.

SWANSEA JOINERS' STRIKE.—A general meeting of the joiners and carpenters now on strike at Swansea was held at the Working Men's Club there on 5th inst. Mr. F. Chandlers, J.P. (Manchester), general secretary of the Amalgamated Society of Painters and Joiners; Mr. W. Matkin, J.P. (Liverpool), secretary of the General Union, and County Councilor William Thorne, of the Gasworkers' Builders' Union, attended and addressed the meeting, supporting them in their contentions, and assuring them of the strong position of the

PROVISIONAL SPECIFICATIONS ACCEPTED.
14,341, E. Wauke and J. Hellige, Holder for Case
A Windows.—14,634, E. Eliot, Indicating Device for I

• Accepted.

RUSHDEN—For erecting three houses, Grove-street, Rushden, for Messrs. Knight & Bradfield. Mr. H. Admitt, architect, Rushden.—
 C. Rosen £757 0
 T. & C. Berrill 501 0
 T. Wilmott, jun. 660 0
 Whittington & Tomlin .. 669 0
 T. Swindall 665 0
 H. Sparrow 594 5
 C. Bayes & Son 596 12
 F. Benson 596 12
 T. Wilmott, jun. 596 12
 T. Swindall 596 12
 A. Revitt 596 12

RUSHDEN—For the erection of four houses, Brookfield-road, Rushden, for Messrs. Fisher & Wadsworth. Mr. H. Admitt, architect, Rushden.—
 H. Sparrow £805 0
 Hackley Bros. 805 0
 Whittington & Tomlin .. 805 0
 T. & C. Berrill 805 0
 C. Bayes & Son 805 0
 F. Benson 805 0
 T. Wilmott, jun. 805 0
 T. Swindall 805 0
 A. Revitt 805 0

RUSHDEN—For the erection of four houses, Windmill-road, Rushden, for Mr. J. Lack. Mr. H. Admitt, architect, Rushden.—
 Hackley Bros. £843 0
 T. Swindall 843 0
 Whittington & Tomlin .. 843 0
 C. Bayes & Son 843 0
 T. & C. Berrill 843 0
 F. Benson 843 0
 T. Wilmott, jun. 843 0
 T. Swindall 843 0
 A. Revitt 843 0

RUSHDEN—For the erection of two houses, Hayway-road, Rushden, for Mr. W. Ekstow. Mr. H. Admitt, architect, Rushden.—
 R. Marriott £547 0
 Whittington & Tomlin .. 547 0
 H. Sparrow 547 0
 T. & C. Berrill 547 0
 C. Bayes & Son 547 0
 F. Benson 547 0
 T. Wilmott, jun. 547 0
 T. Swindall 547 0
 A. Revitt 547 0

SOUTH WOODFORD—For the erection and completion of detached residence at South Woodford, for Mr. A. Althuiser. Mr. H. T. A. Chidgey, architect, Edgware House, Arundel-street, W.C. Quantities supplied.—
 French £778 0
 Gibson 778 0
 Riley 778 0
 Crepton 778 0
 Sim & Shaw 778 0
 George Barker 778 0
 Carter 778 0
 H. Sparrow (accepted) ... 778 0

SWANLEY (Kent)—Accepted for the erection of a further block of cottages at Moulin Hill. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington.—
 Street 165 & 167 £1,107 0
 No competition.

WEST BROMWICH—For the erection of school buildings, Bank-street, Gun's Village, for the School Board. Mr. Edward Funcher, architect, Victoria-street, West Bromwich.—
 John Dallow, Blackheath, Dudley £3,485 0
 * Lowest of ten tenders sent in.

TO CORRESPONDENTS.

A. H. & Co. (below our limit: items must exceed £100).

NOTE—The responsibility of signed articles, and papers read at public meetings, rests of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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THE INDEX, with **TITLE-PAGE**, for Volumes LXVIII. (Jan. to June, 1895) was given as a supplement with the number for July 13.
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READING CASES (Cloth), with Straps, price 9d. each, also
THE SIXTY-EIGHTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.
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 Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. The intended front page Advertisements should be in TWELVE hours on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.
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ILLUSTRATIONS

A Nineteenth-century Attempt at a Large Cathedral. View from North-west.—Mr. A. H. Skipworth, Architect	Double-Page Ink-Photo.
A Nineteenth-century Attempt at a Large Cathedral. North Elevation and Plan.—Mr. A. H. Skipworth, Architect	Double-Page Ink-Photo.
Abbey Gate, Bury St. Edmunds; Norman Tower, Bury St. Edmunds	Two Single-Page Ink-Photo's.
A Street Front.—Mr. R. W. Beddingfield, A.R.I.B.A., Architect	Double-Page Photo-Litho.

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What Should be the Type of a Modern Cathedral?

WHETHER there is any probability of a sufficient number of chances for architects to show what they can do in the design of a modern cathedral, to make it practically worth while consider the subject, is perhaps a question to be asked. But we do not know what things may take in this respect. There is a great deal of awakening and reviving of ecclesiastical enthusiasm in the present day; Church has regained a hold on the popular sympathy which fifty years ago hardly have been supposed possible; church-going population is on the increase; bishoprics are being proportionately multiplied, while at the same time the conception that a grand building, whether secular or sacred purposes, is a thing worth having and spending money upon, is gaining an increasing hold on the mind of the nation. Even in the matter of parish churches we can discern a tendency to aim at the creation of finer and ampler structures than our predecessors of a generation two back would have thought of. Such buildings as the late Mr. Sedding's church in Moone-street, almost like a small cathedral in scale, and with the provision at least of a most sumptuous scheme of decoration, would have been a phenomenon in the earlier part of this century. We have, it is true, no modern cathedral planned on true cathedral scale, commenced in the present generation, and that is at present only half true, though the design for it is complete. We have had a good many cathedral designs produced of late years. There is a design for the new Roman Catholic cathedral at Westminster, still in a somewhat sketchy state, but conceived on a great scale, and possibly destined to be carried out sooner than some people expect. There is the Roman Catholic Oratory Church at Hampton, too, now nearly complete, and which, in an architectural sense, is really a second-class cathedral. We had three great designs for the Liverpool Cathedral produced a few years ago; designs on the largest scale worked out in the fullest detail. And we have the pleasure of publishing in the present number a study for a nineteenth-century cathedral on the largest scale, by a

talented young architect who has evolved a treatment of church architecture characterised by a great deal of originality. It is evident, at all events, that architects are turning their attention to the subject, as one in connexion with which there are possible chances in store for them. The Liverpool Cathedral project failed for lack of funds; but there may have been special reasons for that arising out of the jealousies of opposing parties; it does not follow that the scheme is shelved permanently. We may consider a new cathedral or two, therefore, as a possible event in due time. And it is an interesting question, supposing a new cathedral were to be commissioned, and sufficient funds for it forthcoming, what, in an architectural sense, ought we to endeavour to do with it?

The question has a two-fold aspect; that of plan, and that of architectural style and treatment; not, of course, that these can be considered entirely independently, but the question of plan would be to a considerable extent governed by considerations not purely architectural. The form to be assumed by the plan would depend a good deal on the manner in which the function of the building was regarded; whether it was to be a revival of the Mediaeval cathedral, or a building specially designed to meet the altered feelings and requirements of the church of the nineteenth century.

For the present purpose we may put the consideration of a Roman Catholic cathedral on one side. It is true that we read a few days ago in the daily papers that the Pope is possessed by very hopeful ideas as to the return of the English church into communion with Rome; and it is certainly curious that an idea which a generation ago would have been received with derision and with shrieks of "No Popery," should be even so much as discussed in English newspapers without provoking any special comment or demonstration. It is not our business to express any opinion as to the advisability or possibility, on theological grounds, of such a reunion: all we are called upon to say is, that we think it highly improbable, and that on that ground we may dismiss that side of the subject, and consider only the requirements of a Protestant Cathedral for modern England. The two problems are quite distinct, for the Church of Rome being essentially conservative, and bound to ancient precedent, both the plan and architectural type of a Roman Catholic Cathedral would naturally assume a form dictated by

precedent, either Mediaeval or pre-Mediaeval. A Protestant Cathedral is not necessarily bound to any such type; and as in fact the English Church at the present day is a perfectly different kind of institution from that under which and for which our ancient Cathedrals, the places of worship of a monastic order, were designed, it seems really almost a matter of logic that we should throw over the Mediaeval type of cathedral plan, and consider whether we could not produce a plan more specially suited to the object of modern worship in a great church.

This, however, so far, modern architects seem to have been very unwilling to do. Truro Cathedral, indeed, although externally it proclaims itself as nineteenth-century Gothic, and exhibits a certain character of design peculiar to its architect, might be described as being internally even more Mediaeval than the Mediaeval cathedrals themselves, every pains having been taken to suggest the idea that it was built in the thirteenth-century. All the Liverpool cathedral designs adopted the long nave and transepts of the Mediaeval cathedral, and Mr. Skipworth adopts it also in his plan. Now, no one wants (or ought to want) a merely utilitarian plan for a cathedral; the erection of such a building is an opportunity for soaring above utilitarianism. But the general plan certainly ought to be, in the main, in conformity with the modern use of a cathedral, and from this point of view the long Mediaeval nave is entirely out of place. A modern cathedral may be considered to have a double use for worship; either as a place of service for a moderate number of worshippers in the choir, on ordinary occasions, or for a great congregation in the nave (or some equivalent of the nave) on other occasions; and, in fact, it is being more and more felt that the great use of a cathedral in modern life is for the latter purpose; a place of worship for great congregations. For this purpose an open area is required, not a long avenue. Mr. Skipworth endeavours to give a more utilitarian appearance to his nave by adopting the one-aisle arrangement, with a narrow aisle for passage only at the sides, but this does not make it an effective congregational nave; while its architectural beauty, which is really the only defence of the long nave in a modern cathedral, is very much diminished by this treatment, which is much more suited to a church of ordinary size, where it has a real practical use. A vaulted nave nearly 100 ft. wide between the piers is rather a

serious affair constructively, and as it can only be, judging by the elevation height, about 150 ft. to the crown of the vault, with all this height it would appear disproportionately wide. In the Liverpool Cathedral designs,* both Messrs. Bodley and Garner and Mr. Emerson appear to have felt that a wide area at the crossing at any rate was desirable in a modern cathedral, and both expanded their plans into an octagon at this point, Mr. Emerson's plan being apparently based upon St. Paul's and Messrs. Bodley and Garner's on Ely. This, however, does not prevent their long naves being anachronisms; the octagon crossing is only a halfway step, but it has no doubt the architectural advantage of getting rid of what Fergusson rightly characterised as the bathos of the Gothic church—the narrow square opening under the central tower. It is the same perception evidently which has led Mr. Skipworth to expand the centre of his design into a great dominating mass, giving far more power to the centre than is obtained by the narrow Mediaeval tower; his treatment of this portion is very striking, and is the finest point in his design.

But all this does not give us what we really want in a modern cathedral plan. We want a choir for the ordinary daily service of the cathedral, and a wide space for the large congregational service, and we want to keep them close together and in relation with one another. There are three types of plan which might answer this purpose. There is that of Wren's first design for St. Paul's, a grand conception, defective in some of its details, which might very well be taken up, if an opportunity offered, and treated anew with better detail. Then there is the magnificent plan and general conception of St. Sophia, perhaps the finest building ever erected as a Christian church. And here, too, there would be a great opportunity offered to the modern architect, of combining this splendid type of interior design with an equally fine and effective exterior, the lack of which is the one great defect of St. Sophia. There is a third type suggested by that remarkable church, St. Gereon at Cologne; the long choir with the elliptical nave; a plan which would be exceedingly suitable for a modern cathedral, and which affords a splendid opportunity for architectural effect.

In his plan Mr. Skipworth has suggested an interesting modification by introducing a small cloister, not in the usual Mediaeval position, but abutting against the south wall of the choir, and giving access to a chapter-house at the south-east angle. This is both picturesque and convenient, giving the cloister a use as the means of passage for the clergy from the choir to the chapter-house; whereas a cloister adjoining the nave, in the usual place, would have been a mere archaism, of no use at all. We fear it can hardly be considered equally defensible to insert a Lady Chapel east of the choir. We do not at all events pay divine honours to the Virgin now, and therefore a Lady Chapel is an anachronism.

The question of style for a modern cathedral is an even more difficult one than that of plan, since it cannot be directly settled or influenced by the practical considerations which would at all events have considerable weight in determining the nature of the plan. The form of plan adopted would, however, no doubt to some extent suggest the nature of the architectural treatment most proper. It is not of course surprising that in the Liverpool cathedral designs the two architects who adopted a completely Mediaeval plan, Mr. Brooks and Messrs. Bodley and Garner, also adopted a Mediaeval design; that of Mr. Brooks being distinguished however from genuine Mediaeval work, like Mr. Pearson's exterior design of Truro, by the special character of the architect's own handling, which in each case, though

entirely founded on Mediaeval work, is quite distinguishable from it. Mr. Emerson alone, among the Liverpool competitors, adopted a really novel architectural treatment, showing a somewhat Classic outline and general effect combined with a detailed treatment based on Early Gothic, and adapting the dome as a Gothic feature. Mr. Skipworth has expanded into a large cathedral a manner of treatment which he may be said to have invented for himself, and which he has already elaborated in some very charming and original designs for churches; a style in which details derived from Gothic are treated with a certain degree of Renaissance feeling, and which is in fact one of the natural results of the prevalent feeling at the present moment for a rather free mixture of the elements of Classic and Gothic detail, though in Mr. Skipworth's work the Gothic predominates very much. In the small churches which he has designed this style appears charming; but we question whether it is not too delicate, light, and deficient in breadth and power when made use of for the architectural expression of a great cathedral. The defect of his cathedral design seems to us to be that it wants scale, and does not produce in perspective the impression of being so large a building as the geometrical elevation to scale shows it to be. No one looking at the perspective view would imagine that the towers which flank the west front are 300 ft. high to the apex of the spires; they do not give the impression of more than half that height, if even that. Even the traceried windows as shown in the elevation do not act as a sufficient corrective; no one looking at the elevation would guess the main side windows of the nave to be twenty feet across, without reference to the scale. In fact, the scale on the drawing ought to be reduced at least one-third, if not one-half, to fit the character of the design, which in other respects contains a great deal that is very charming. But we do not think it is the style for a cathedral. It is too pretty for that, and wants breadth and mass.

Nor would the elegancies of even the best varieties of "free classic" now practised be a suitable architectural dress for a great cathedral. Charming for house-fronts, and even for town-halls, this is a style in which grace and elegance rather than grandeur is to be expressed.

No; if a chance should yet arise for a great modern Protestant cathedral to be built in this country, there is something more to be done with it than the forms of architectural design just at present most in fashion will supply. We should break away both from the current fashions of the present moment in regard to design, and from the influence of Mediaevalism in regard to plan. We should have a cathedral with a great domed central space, with a sufficient *avant-corps* to form a grand vestibule or approach to it, and a ritual choir opening out of it eastwards. And it is possible that we might find, in either the graver Classic style of the Renaissance, or in the suggestions of Byzantine architecture, the finest motive, not for an imitative Classic or Byzantine cathedral, but for something founded on either of those styles, but treated in a modern spirit. We have three great examples before us, all of them imperfect in one way or another. We have St. Sophia, with a glorious interior but a bad exterior. We have Michelangelo's St. Peter's (without the subsequently lengthened nave which destroyed its balance), but with the mistake of the employment of a colossal order which destroys the scale, and of misapplication of windows in stories which have no existence in the structure itself. St. Sophia with a grand exterior treatment; St. Peter's without its faults of scale and detail; Wren's conception of a Greek cross cathedral, without Wren's weak and commonplace detail: these would surely be objects better worth aiming at, in case of the chance for a new cathedral, than the repetition of a Mediaeval plan and design evolved under

circumstances quite different from those under which a modern Protestant cathedral would be erected. Nor must we forget either, the type suggested by St. Gereon; single experiment of the greatest originality and suggestiveness, which might well be further development. It is to be hoped English architects may yet have a chance of producing a great cathedral on one or other of these types.

A COUNTY SURVEYOR ON HIGHWAYS.

IMEDIATELY prior to the passing of the Local Government Act 1888, three-fourths of the cost of maintenance of the main roads throughout the county was contributed, on half by the county authority, and one-quarter by the Imperial Exchequer. The county authority (then the Court of Quarter Sessions) had no direct administrative power over the main roads beyond that of withholding the grant when the roads were maintained to the satisfaction of the surveyor, as shown by his certificate. It appears that the main roads in Nottinghamshire were managed as follows:—

	Miles.	Furlons.
By 4 highway boards	120	3
By 90 parishes	146	7
By urban authorities	54	0

Under this multiplicity of, for the most part, unskilled management anything like uniformity was impossible. "On one road twelve miles in length, could be found many as ten different attempts at road-making, with ten different results." It is not surprising, therefore, that the Notts County Council took an early opportunity of availing themselves of the powers conferred upon them by the Local Government Act, 1888, and took over the entire management of maintenance of the rural main roads within their area.

We do not purpose entering into the vexed question of the efficiency or economy of direct county management as a general principle, but in the present case we may say that the system appears to have worked satisfactorily. The Notts County Council had favourable opportunities for striking a new line, and full advantage was taken of them by the introduction of the elaborate system now at work, which was evolved under their direction by their Surveyor, Mr. E. P. Hooley. We are disposed to congratulate the Notts County Council upon their grasp of the situation which they evidently showed in obtaining the services of a practised and zealous road engineer instead of continuing the custom of appointing an architect to superintend work of this kind, which requires so much special experience and knowledge to carry it out satisfactorily.

One of the principal effects of the Local Government Act 1894, was to transfer the duties of maintenance of rural roads to the District Councils within whose area they lay. The Rural District Councils of Nottinghamshire, therefore, in a less degree, been placed with regard to the rural roads, in much the same position that the County Council were a few years earlier with regard to the main roads. With a view to assisting the newly elected District Councils, a conference was held at Nottingham in May, 1895, under the presidency of Lord Belper, Chairman of the Notts County Council, and of Colonel R. Denison, R.E., Chairman of the Highway and Bridges Committee, at which the County Surveyor, Mr. E. P. Hooley, read a paper describing the system of management devised and adopted by the Council. In response to the unanimously expressed wishes of the delegates present at the Conference this paper has now been published.*

In the course of it the method of keeping the accounts connected with the main roads is

* Full illustrations of the three Liverpool designs will be found in our volume, for the first half (January to June) of 1895.

* "Management of Highways." By E. P. Hooley, A.M.Inst.C.E., County Surveyor of Nottingham. London: Biggs & Co. 1895.

plained, and specimens of the wages sets and the various books in use are given. The system of accounts is very complete, admitting of easy and accurate checking, and will doubtless form a useful guide for the new District Councils. It involves, however, an amount of clerical work which is rarely to be expected from a surveyor to a District Council, especially when that officer has to perform the sanitary as well as the highway work. It is not every surveyor who has at his command the services of "two writing clerks." It must not be remembered that methods which are necessary for the effectual working of a large district are frequently unnecessary, and even judicial, in a small one. Nottinghamshire no doubt, a very enlightened county, and its labourers found there have probably profited by the advance in education, but we venture to think that too much is expected of the way of literary effort from the class in which the best road-labourers are usually drawn. It is a decided disadvantage to a system that it should exclude skilled men in all cases where the labourer cannot write a report.

The author proceeds in a practical manner, commenting upon the processes usual in road maintenance. He emphasises the saving of materials which may frequently be attained by an intelligent application of manual labour. We must here enter a protest against the absurd practice of fixing the portion which the total cost of manual labour shall bear to the cost of materials. In the same district the cost of materials varies to the extent of hundreds per cent., quality being the same, and the rate of wages not varying. How then can any assigned proportion be true except within very limited areas? Our own opinion is that it is both misleading and useless.

We cannot endorse Mr. Hooley's assertion that "machine-scraping should never, for any circumstances, be allowed." If employed properly, and with judgment, it is much more economical than it is damaging, especially with certain descriptions of materials. With regard to materials, Mr. Hooley says that each ton should spread only 20 yards one stone thick. This "one stone thick" is a rather vague definition, and Mr. Hooley will confer a benefit upon the students of the literature of road-maintenance by explaining exactly what he means by the expression. Mr. Hooley's definition of a "recently-formed road," viz., "a road with a depth of metalling on it" will be generally admitted as extravagant, and would induce a thrill of horror in most highway authorities who are charged with the maintenance of rural district roads, and who are the interests of the ratepayers at heart. "Materials," says Mr. Hooley, "should never be applied more than two stones thick in one time." Taking this statement in conjunction with the area that can be covered by a ton of material "one stone thick," given above, this limit of thickness should only be reached where a steam-roller is in use, and would never do where the materials are to be consolidated by the traffic alone.

Regarding the economy of coating a road with the assistance of a steam-roller in summer as compared with winter, Mr. Hooley states that "the only extra expense (in the winter case) arises from more watering being required; but inasmuch as watering is required at all times, the water is only about another horse's time." In the remarks which follow, Mr. Hooley apparently overlooks the long distances which water has frequently to be hauled in rural districts in summer-time, on account of the drying up of sources of supply available during the wet seasons.

In calculating the working expenses of the steam-roller, Mr. Hooley states that a charge should be invariably included of 10 per cent. depreciation, an allowance which may be accepted as correct for general purposes; and he estimates the average life and work of a roller as amounting to about 30,000 tons of material consolidated. The Notts steam-

rollers, which are employed all the year round, consolidate between thirty and forty tons of material per day, according to traffic, &c.

Some very useful forms of contract and agreement, and specimens of by-laws, together with accounts and details of expenditure, are given at the end of the book, from which in other respects much valuable information may be obtained, though the conclusions set forth in it must be followed with discrimination.

NOTES.

IN a letter addressed to a daily contemporary, and signed "A Grandson of Thomas Papworth," the writer of the letter avers that the screen in front of the Admiralty, at Whitehall,

"Was designed and executed by Thomas Papworth, and I have heard my late father say that he was never paid for the work."

In the account of Thomas Papworth (1775-1847), contributed to the "Dictionary of Architecture," by Professor Donaldson, Wyatt Papworth (his son), and another jointly, we find no mention of this. In that same work we read, *s.n.* Robert Adam (1728-92):—

"The screen in front of the Admiralty dates from this year [1760]."

In Wyatt Papworth's edition (1881) of Gwilt's "Encyclopedia of Architecture," page 222, is this passage:—

"Ripley, it must be confessed, failed at the Admiralty, which was afterwards veiled by Mr. Adam's beautiful screen, since cruelly 'cheated of its fair proportions' by the late architect to that Board, in order to make two coach entrances, which might, by the exercise of a little ingenuity, have been managed without defacing the design."

The screen as originally designed, with ten columns and one (a central) gateway only, appears in the print by Medland, after Miller, published in 1796 by Colnaghi & Co., and bearing Earl Spencer's coat-of-arms at foot. Perhaps the additional coach entrances were made by Thomas Papworth; yet we have failed to discover that he was at any time Architect to the Admiralty. The dates we cite above do not support his grandson's statement, as they tend to show that the screen was built fifteen years before Thomas Papworth was born, and about the time when Robert Adam began his career of practice with his brother James. Moreover, in Part IV. of "The Works in Architecture of Robert and James Adam, Esquires," 3 vols. fo. 1773-1822, is D. Cunego's plate, 1775, inscribed: "View of Part of Whitehall, Shewing the Admiralty Office, with the New Gateway [the screen, with one gateway] designed & executed in the year 1760." We observe that the writer of the letter in question repeats the common blunder of writing the architect's name "Adams" instead of "Adam."

A CORRESPONDENT of the *Times*, under the signature "Citizen," draws attention to a resolution of the Corporation of Rochester to repair the south-west turret of Rochester Castle. He complains that they have already repaired the north turret and restored it "in new stone with sharp edges," and that the ancient rugged appearance of the tower is entirely destroyed, and urges that the Corporation should be prevented from doing anything more to the tower. We have not seen the new work referred to; but if it is necessary for the security of the structure to rebuild a portion of the turrets, we certainly should be in favour of it being done as new work, not with any effort to make it look old. The real question would be whether it was absolutely necessary to rebuild the portions referred to at all; whether they could not have been made secure without actual rebuilding.

IN the annual report of the Borough Engineer of West Ham we find, under the head of "House Drainage," a grave complaint as to the effect on the borough of a certain recent decision of the Queen's Bench Division in regard to combined house drains. The report says:—

"The effect of the new interpretation of the Act is very largely to convert 'combined' back drains into public sewers, although on private premises, and thus relieve owners of the responsibility of their maintenance and place it upon the Sanitary Authority. In the Borough of West Ham this means the conversion of many miles of private drains, good, bad, or indifferent, into public sewers. It is estimated that nearly three times the length of the street sewers are thus thrown on the Corporation. Very much of the private drainage was laid many years ago in marsh lands, and by 'jerry builders,' without sufficient supervision. The previous practice has been to serve notices upon owners to rectify defects, but now the Medical Officer serves notice on the Borough Engineer to reconstruct such defective works. It is a very serious matter to have the responsibility of some 300 miles of imperfect private drains thrown on the rates."

The position is no doubt an unfortunate one at present for the borough of West Ham, inasmuch as they are compelled to make good out of the rates defects of drainage which have arisen from the neglect of drains which hitherto have been, in a legal sense, private drains. But is not the surveyor's complaint as to the state in which these drains now are, and the expense entailed in getting them into proper order, in itself an indication that they ought to have been in the hands of the public authorities all along? That any drain into which the drainage of more than one habitation is taken should be regarded as a public sewer and be under the direct responsibility of the public authorities appears to be by far the safer course. It may bear hardly on the Corporation of West Ham in the present instance, although, seeing that, by their own showing, they have always had power to serve notices on owners to remedy defects, it would appear that the bad condition of these drains, of which Mr. Angell complains, is indirectly the fault of the Corporation themselves.

THIS is the season of the issue of vestry reports. The thirty-ninth Report of the Vestry of Chelsea, for 1894-5, chronicles among other matters the installation of electric lighting in the large hall, the Council Chamber, and other rooms on the ground-floor of the municipal offices. The account of the steps taken by the Vestry to obtain a reduction in the price of gas to private consumers is worth note, as showing that a firm attitude towards gas companies may bring its own reward. Early in the year 1892, the price of gas to private consumers had been raised by the Gas Light and Coke Company from 2s. 9d. to 3s. 1d. per thousand cubic feet. In June, 1894, the Company reduced the price from 3s. 1d. to 3s. per thousand, and intimated that, if their finances permitted, a further reduction of 1d. per thousand would be made in December; but, to the Vestry's astonishment, the company, at the same time, raised the price of the gas supplied to public lamps from 2s. 2d. to 2s. 4d. per thousand. Bearing in mind the fact that on the south side of the River Thames, where there is a competitive supply, the company's charge to private consumers was only 2s. 4d. per thousand, the Vestry addressed a letter of remonstrance to the company, protesting against the endeavour to indemnify themselves at the expense of the ratepayers against any loss they might sustain by making a reduction in the charge to private consumers. The company rejoined by stating that, in the parish of Chelsea, the reduction of 2d. per thousand equalled a sum of 3,600*l.*, whilst the increase in the cost of gas consumed in the public lamps would amount to only 200*l.*—or a net annual reduction in the company's revenue of 3,400*l.* It would appear, however, that the remonstrance of the Vestry was not without effect, inasmuch as in the following July the company announced that the charge to private

consumers would be still further reduced to 2s. 10d. per thousand, at the close of the quarter. The Report touches also on the subject of the frost and water supply, in regard to which it is mentioned that more than 650 applications were made to the Vestry for licenses to open the roadway for the purpose of repairing burst water-pipes. In this connexion an important question was raised as to liability for the repair of the burst pipes, but at the close of the year the Law Committee were still deliberating upon the matter.

IN the Surveyor's Report to the Chelsea Vestry (which is a distinct document from the Vestry Report) some information is given as to the use of various granites for macadam, in experimental lengths of road. The granites experimented with were Hartshill, Belgian, Enderby, St. Ives, and Guernsey. The Belgian shows the worst record, the Enderby is a little better. The Guernsey, Hartshill, and St. Ives pavements appear to have worn about equally well; it is found that the St. Ives 'macadam breaks very small under traffic, but maintains its surface well. The outcome of the experiments is a recommendation to make further trials of Hartshill and St. Ives granite.

A REPORT by Dr. King Warry to the Board of Works for the Hackney District, on the sanitary condition of the district, contains some points worth attention. In regard to an outbreak of diphtheria in an establishment where a number of girls were employed, Dr. Warry, although noticing some sanitary defects, did not find cause to attribute the outbreak of the disease to them, but came to the conclusion that it had been introduced from without by one of the inmates, and that it had probably been communicated to others on another floor through the medium of the speaking-tubes. He says:—

"In confirmation of the above view, I must refer to the earlier part of the report, in which I state that only one of the shop assistants on the ground-floor suffered from sore throat. I learned, on inquiry, that it was the special duty of this assistant to answer the speaking-tube communicating with the infected workroom. Whether the tube had become infected throughout its whole length, and so conveyed the infection to this assistant, or whether her illness was a coincidence, I cannot be certain; but I do think the incident significant, and confirmatory of the above views."

On another page of the report we read a gratifying account of the condemnation and demolition of twenty-four back-to-back cottages in Jerusalem-gardens, at the instance of the Medical Officer and after a considerable diplomatic correspondence. Another point touched upon in the Report is the dirty condition of the River Lea, which was the subject of complaint in Dr. Warry's Report of the previous year. The Lea receives the effluents from the Leyton and Walthamstow sewage farms, and the London County Council have lately constructed a bathing-pool in the recreation-ground of Hackney Marsh, to be fed by the Lea water from a point below the entry of these "effluents." As remarked in the Report, "it is obvious that water, little removed from sewage, is not fit to be turned into a bathing-pool. I am of opinion that it is the duty of the Lea Conservators to prevent this nuisance; but in the failure of this body to do their obvious duty, either the Local Authority, or the London County Council, or both, should press the Conservators to bring an action against the offending Local Boards to compel them either to produce a pure effluent, or to turn it into some other channel. Such proceedings would of course be taken under the provisions of the Rivers Pollution Acts." In regard to the question of water-supply, Dr. Warry considers that the failure of the East London Water Company to give a constant supply during a part of the year when it is most essential, opens up the serious question whether the present is a proper and sufficient supply for such a

district as Hackney. A "proper and sufficient supply" is at least one which will be able to meet a drought of two years without restricting the supply to the consumer. This the East London Water Company has failed to do. Moreover, adds Dr. Warry, "the satisfactory working of our present system of drainage and sewerage is dependent upon an adequate and unstinted supply of water," a point which we have urged frequently.

THE transactions of the American Society of Civil Engineers for last June contain an excellent paper by Mr. E. Gerber on the painting of iron structures exposed to the weather. Much attention has been given to the subject of preventing rust by painting, and much has been both said and written during the last few years about the worthlessness of iron oxide as a pigment in paints used for coating iron, and on the supposed superiority of red lead for such purposes. The objection urged against iron oxide is that some of it is manufactured from iron by the action of a sulphur compound, and consequently it is supposed to contain sulphur, which would of course be deleterious to the ironwork covered by such paint. In the case of red-lead it is claimed that it forms a chemical combination with the oil with which it is mixed, and that, when properly applied, it adheres with great firmness, forming an absolute covering, which is impervious to both air and water. In order to ascertain the value of various paints after they had been in use some years, Mr. Gerber examined a large number of bridges, and from his observations he comes to the conclusion that pure iron oxide, used as a pigment in paint, forms a most effective covering, and is not itself a cause of the rusting of metallic structures, but is quite as good as, if not better than, red-lead. With many of his remarks on the system of painting now generally adopted we thoroughly agree. He says, for instance, that structural ironwork should not be painted at all before it leaves the manufacturer's yard, it being much better to merely give it a coat of pure linseed oil. This, no doubt, is a good rule to adopt, because, in this country, at least, the manufacturers are so anxious to get the ironwork sent away—to clear their yard—that it very frequently happens that the painting, being the last operation, is badly done, and if wet weather happens to prevail at the time it is worse than useless. Besides these drawbacks, when the ironwork has been painted it is much more difficult to ascertain if the workmanship has been what was required. The first requisite in the direction of preserving iron structures is to ensure absolute cleanness of metal before anything is applied. This is best secured by thoroughly "scraping" it in the shop; and immediately after this is done the work should receive a coat of oil, applied when the surfaces are quite dry. In this way nothing is invisibly covered up, and if the scraping and cleaning has not been properly done it will be apparent. Those in charge of the erection can then easily see if everything is as it should be, and can superintend the final painting themselves.

THE utilisation of the heat generated in dust-destructors has been a favourite problem for engineers during the last few years. The solution which has commended itself to the Shoreditch Vestry is to use it for generating steam to drive electric-lighting engines. Their combined dust destructor and electric-lighting station, which is now in course of construction, is expected to begin working next January. This scheme is being worked under favourable circumstances, and it will be watched with great interest by local authorities elsewhere, as it seems that the destruction of refuse by fire must sooner or later become a necessity. Forced draught will be used, so that the combustion will be practically perfect, the temperature being well over

1,500 deg. Fahrenheit. As the heat generated will be practically uniform during the twenty-four hours, and as the load on an electric lighting station is a very variable one, the evening load being often twenty times as great as the morning one, special arrangements have been made for storage. The great cost of accumulators excluded the adoption for the entire storage of the excess energy, so thermal storage on the system devised by Mr. Halpin was adopted in addition. The boilers will be constantly employed generating high-pressure steam and passing it into cylindrical receivers enveloped in non-conducting material. These receivers will be nearly full of water, which will be maintained by the steam at a temperature nearly equal to that in the boilers. This water, heated will give off steam, and thus meet sudden fluctuations in the load, the engine power being about four times the destructive and boiler power. As the feed water also passes through the cylinders, there will be no deposit on the boilers, a deposit on the receivers doing no harm, as no part of them is in contact with the flame, and being of simple construction, they can be readily cleaned. The success of the scheme at Shoreditch seems assured, as already a great many orders have come in for electric lighting and power, there being a large number of small factories and workshops near the station, where electric motive power will be very acceptable.

WHEN will house-agents and others learn that the sale of house property is not expedited by disfiguring a street with great staring bills and posters on hoardings? It is strange to find a body of men of acumen and ability deliberately pursuing a method of advertising which in no considerable measure helps to defeat rather than promote their own object. What is the effect of a display of this kind upon the average house-hunter? A street which presents a large and varied assortment of announcements of this character is at once condemned as an undesirable place of residence; a beggarly array of empty houses, to which attention is directed in the most emphatic manner possible, conveys in all probability an entirely false impression as to the character of the thoroughfare; but to the intending resident the appearance of a street is of considerable importance; and if it be neglected, as it undoubtedly is in this respect, the landlord inevitably suffers the consequence. One cause which contributes to the aggravation of the evil is the practice of employing two or even three house-agents to let the same property. An empty house thus becomes the scene of a brisk competition between the two or three business rivals, who between them frequently succeed in spoiling the appearance of an otherwise attractive habitation. Would it not be possible to improve matters by substituting smaller notices for those now commonly used? That some such reform would greatly improve the appearance of hundreds of streets in the Metropolis, and elsewhere, cannot be doubted; and bearing in mind that improvement in this direction means enhancing the value of house property, the question certainly appears to be worth the consideration of those who are interested in the business aspect of the subject.

THE new premises for the Birkbeck Building Society now in course of erection stand on the east side of Southampton-buildings, where a large area has been cleared. Amongst the houses pulled down was the last remaining portion of the London Mechanics' Institute, which Dr. Birkbeck founded in 1823, and which was subsequently named the "Birkbeck Literary and Scientific Institution." It is now established in the premises opened in 1884 in Bream's buildings, Fetter-lane, of which we gave account in our issue of September 27, the year. The Building Society and Bank were

established nearly fifty years ago. The new offices about on the site of the Old Temple, hence the Templars, after a sojourn there during twenty years, migrated in 1884 to Fleet-street. Bream's-buildings was extended into Fetter-lane in 1881-2. It had been into possession of the Ecclesiastical Commissioners two years before, and consisted of squalid houses, the homes of many members of the criminal classes. According to Wale's "London and its Environs Described," 6 vols., 1761, it is named after one Breme, the landlord or lord thereof.

THE volume of the "Transactions of the Society of Engineers for 1894," including also a complete index and list of members from 1857 to 1894, contains practical papers of great value and interest, which is added to by the full publication of the discussions. Among the papers of principal interest to our readers is that on "Pile-driving," by Mr. Henry O'Connor, and on the "Utilisation of Town Refuse for Generating Steam," by Mr. T. W. Baker.

IN order to encourage students, and Associates not in practice, to prepare themselves for the R.I.B.A. examination, the Northern Architectural Association are offering prizes of two guineas and one guinea respectively for the best set of drawings or testimonials of Study, as required by the Institute for the "Final Examination." It is intended to offer similar prizes also for the probationary work for the "Intermediate Examinations."

THE secretary of a provincial architectural society writes to us:—"About Christmas time you threw out a hint in your columns to architects with superfluous books duplicate copies that they might seasonably number struggling provincial societies. It appeared to me a particularly happy idea, but unfortunately your suggestion was not acted upon. I would go further and propose that architects without family, or without sons following their profession, should bequeath their libraries to such societies. In many cases an architect's only takes little or no interest in the professional literature he has left behind him, and before long the books are stored away and probably forgotten." Perhaps architects who are making their wills may be disposed to bear in mind the suggestion of our correspondent. It is, we believe, not infrequently the case that collections of architectural works made by an architect are of little use and interest to any of his relatives after his death, and it would be a good deed to provide for the books going where they would be of real service.

WE are glad to see that Mr. Ruskin, who has been interviewed on the subject of the wretched proposal to destroy the Falls of Foyers, has expressed himself, might have been expected, in the strongest terms of indignation at this proposed destruction of one of the most beautiful scenes in Scotland in the interests of a trading company.

THE BRITISH ASSOCIATION.

THE Ipswich meeting of the British Association, which terminated on Wednesday last, was very well attended throughout, but the papers read were not up to the standard of some previous years. The fact is, we no longer look to the Association to yield us anything sensational in the way of scientific discoveries. Years ago, when but few scientific societies were in existence and science as a whole was more noisily pursued than it is at present, the meetings of the Association afforded an opportunity of getting rid of much that is now discussed elsewhere. In those

days, when anything important had been discovered, the results were stored up until the next meeting of the Association, but now, scientists cannot wait so long, they are impatient and must make known the results of their work as soon as possible.

It is thus easy to see why the annual meetings were looked forward to with feverish interest by scientists. Almost the sole objects of attending them now are for the good fellowship engendered by the occasion, and to make good any excuse that may have been put forward for the loosening of the Association's purse-strings on behalf of the person attending. If he does not attend he may not obtain the "grant;" or rather, if his friends and supporters do not attend it may be lost. And as to the grants: many of them are, no doubt, given to individuals who are conscientiously working and require material assistance, but one cannot look over the list year after year without asking whether, in certain cases, these grants have not been transformed into pensions. Why is it that money is voted every year to those scientists of the old school whose sole duty in life, apparently, is to describe so-called new species of animals and plants? Their only contributions to the "advancement of science" is in burdening the literature with interminable synonymy. They do nothing in the way of working out the analogies of the "forms" described, and their "science" has now degenerated, as seems fitting, to a species of lore. This sort of thing did very well in the absence of deeper work, but it is no good nowadays—so says the younger school of scientists.

Another thing that strikes us as becoming more and more developed every year is the tendency to compile papers to be read before the Association, for advertisement purposes. Almost the only occasion the daily papers take notice of the different professors and their *professors* is at these meetings, and the average scientist is not above improving that occasion, we are sorry to say. No one can look over the papers read who knows much in a specialised manner about the different branches of science, without feeling that he has seen the majority of those papers before. They are now served up as a new dish, and are relished by few; this is more particularly the case with the sections devoted to pure science, in some of which, we happen to know, there is difficulty in getting sufficient papers to spin out the meetings. The aim of many contributions, apparently, is to catch the eye of the public, so subjects like civilisation, cannibalism, and missionary enterprise come well to the front. But if the average scientist likes to see his name in the daily paper and shapes his course accordingly, he has a most profound contempt for the "science" found in the daily Press, and small wonder at it. The reports of certain of the speeches delivered last week will assuredly be cherished by the orators as magnificent examples of what can be done by the newspaper reporter when the latter does not understand a particle of the matter under discussion, and feels compelled to furnish an original contribution to his paper, based on the speeches referred to. If the reporter occasionally shears the scientist of his degrees and other attributes, he makes up for the omission by showering new dignities and honours right and left. In one instance during the past week a dead man—the late Professor Seeley, of Cambridge—was made to deliver a speech on dinosaurs; but that, we suppose, does not matter for "the general reader."

The President's address was read at the opening meeting on Wednesday, and we referred to that in our last issue. Thursday was occupied in hearing the addresses of the presidents of sections. We will briefly allude to such of these, and to papers subsequently discussed, as may be interesting to our readers.

In the Chemistry Section Professor Raphael Meldola reviewed the state of the science in 1851, and briefly glanced at recent developments. After alluding to the discovery of argon, he remarked that Professor Ramsay had isolated helium, a gas discovered by means of the spectroscopic in the solar chromosphere in 1868. Like argon, helium is monatomic, and chemically inert so far as the present evidence goes. The isolation of helium had not only furnished another link proving community of matter, and, by inference, of origin, between the earth and the sun, but an extension of the work by Professor Norman Lockyer and others had resulted in an interesting discovery that a large number of the lines in the chromospheric spectrum, as well as in certain stellar spectra, which had hitherto found no counterpart in the spectra of terrestrial elements, can now be accounted for by the

spectra of the gases contained with helium in certain rare minerals. The question now to determine was whether these gases are members of the same monatomic inert group as are argon and helium.

Mr. W. Whitaker, in the Geology Section, delivered a popular address entitled "Underground in Suffolk and its Borders." The chief object was to show how well-sinking has furnished a knowledge of geology which would otherwise not have been obtainable. The results of borings for coal in the south-east of England were used in illustration. Practically nothing new appeared in this discourse, and our readers are familiar with the main outlines of the subject from what has appeared in the *Builder* from time to time. The only addition had reference to a boring in the eastern counties.

In the Zoology Section, Dr. Herdman gave a general discourse on the science. Amongst other things, he touched on the diseases of edible animals. Speaking of disease communicated by mussels, of which we have heard so much lately, he remarked that it is clearly of the greatest importance to accurately determine under what conditions the mussel can become infected by micro-organisms, in what stage it is injurious to man, and whether, as is supposed, steeping in pure water, with or without the addition of carbonate of soda, will render poisonous mussels fit for food. The supposed connexion between oysters taken from contaminated water and typhoid was alluded to, and the president said that this point could only be solved by actual experiment.

Mr. L. F. Vernon Harcourt delivered an address to the section devoted to Mechanical Science upon the relations subsisting between engineering and the sciences of mathematics, physics, geology, chemistry, and meteorology, the chief object being to show that engineers did a lot of useless work through not studying the practical applications of these sciences so far as they bear on his profession. The scientific training of engineers was touched upon, in the course of which he remarked that the Institution of Civil Engineers had in recent years required some evidence of young men having received a good education before their admission into the student class, but it was quite unnecessary to become a student at the Institution in order to become an engineer. Engineers of the past were, mostly, self-taught men, but he thought that all recruits to the profession at the present day should show ample qualifications in theoretical knowledge at the time of their entrance. He struck the keynote to the whole subject, however, in remarking that if men of science, by closer intercourse with engineers, could realise more fully the practical capabilities of their researches, and engineers, by a more complete scientific training, could gain a clearer insight into the scientific aspect of their profession, both might be able to co-operate more thoroughly in developing the resources of Nature, and in furthering the intellectual and material progress of mankind.

On Friday all the sections were busy. The Geology Section gave ear to Professor Sollas' description of how glaciers can crawl up hill, and to the consideration of flint implements found at Ightham, in Kent. The Mechanical Science Section reviewed the "Growth of Harwich," and the general tenour of the paper read by Mr. William Birt was an advertisement for the Great Eastern Railway Company. Mr. G. J. Symonds contributed some notes of facts and figures relating to the autumn floods of 1894, suggesting that much damage could be prevented by engineering remedies based upon observations and records. He exhibited a series of photographs illustrating the conditions produced by floods at various places on the Thames. A paper was contributed by Messrs. Rapier and Stoney on the practicability of controlling the discharge of flood waters by means of removable weirs more efficiently than by fixed weirs. From the drainage aspect, it was stated, the fixed weir was only a blundering, stupid obstruction; and the first use of a river was the drainage of the country. The rainfall reaches the river more rapidly now than formerly, and therefore the river ought to be widened, deepened, or straightened; but for navigation there must be capacity without velocity. The river must be fully capable of discharging maximum floods under modern conditions. The fixed weir must be low enough to allow the flood waters to get off somehow, and during ordinary river flow has to put up with less head of water and less power than Nature supplies. Thus the fixed weir provides only an efficient compromise; and it was obvious that the maximum range of

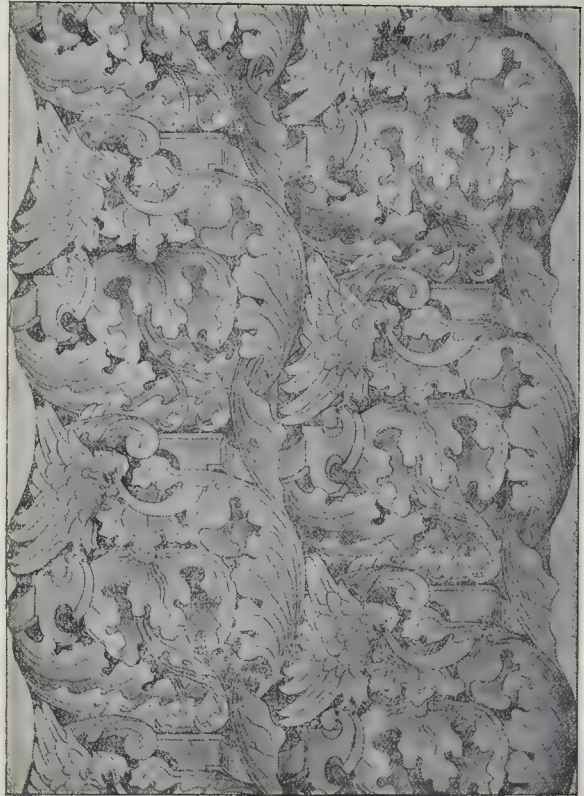
requirements may be fulfilled by means of a removable barrier. Removable weirs—a sluice-gate on free rollers—could be applied to any river for navigation, irrigation, or power. They could be operated under all conditions of head and flowing water. The great sluices erected twelve years ago at Belek to control the waters of the Loch Erne group of lakes are a fair example of maintaining a full summer water level for navigation and mill power whilst giving absolute command of great periodical floods. The Manchester Ship Canal affords a useful example of the application of these sluices to canalised rivers. There are others across the Rhone near Geneva, at Richmond on the Thames, and for the river Clyde at Glasgow.

On Monday, in the Section of Mathematical and Physical Science, Professor John Milne presented the report of the Committee on Earthquakes in Japan. It contained the records of the Gray-Milne seismograph during the past year, and included a catalogue of 8,331 earthquake shocks recorded in Japan between 1885 and 1892. The catalogue gives the position of the origin of each shock and the extent of country sensibly disturbed, and it enables Japan to be divided into fifteen seismic districts. It may therefore prove of great assistance in future inquiries. The report then dealt with the propagation of earthquake disturbances on the surface of and possibly through the earth.

In the evening the hall was well filled by an audience consisting chiefly of working men, to whom Dr. Alfred Fison delivered a lecture on "Colour."

M. M. Ernest van den Broeck and G. Dollfus made communications to the Geology Section on Tuesday on the Tertiary Beds of North-Western Europe, which has considerable practical bearing from water-supply and other points of view, but all the particulars given have been known for years to students of the subject, and we cannot conceive why the papers should have been admitted. A chapter from a recent text-book on geology would have done quite as well. In the Mechanical Science Section the day was devoted to electricity, when Mr. Philip Dawson described in detail the modern applications of electricity to traction purposes. He insisted upon the especial adaptability of electric traction to tramways and light railways. Three methods of electrical power transmission were practically employed—(1) elevated conductors with trolley contact; (2) sub-surface conduit; and (3) surface or third rail conductors. The first was by far the most efficient and successful, and in most extensive use. Mr. Bennett dealt with the development of telephonic communication in the United Kingdom, which he said was inferior to what had been attained in many foreign countries; and an improved photometer was exhibited and described by Messrs. Trotter & Preece.

The engineer to the New River Company made a communication to the geologists on Tuesday respecting the dip of the Underground Palaeozoic rocks at Ware and Cheshunt. The borings at these places were undertaken by the New River Company with the object of procuring water from the Lower Greensand; but on reaching certain depths it was found to be hopeless to expect water from below the Gault. Orders were about to be given for a cessation of the work, but on the expression of a wish by certain geologists that attempts might be made to learn the direction of the dip of the lowest stratum reached, in each case, the company generously ordered the investigations to be made at their own expense. The borings were made by the use of black diamonds; but, though the exact angle of dip of the material pierced can be accurately ascertained, the rotation of the apparatus precludes all knowledge of the direction of the dip. Hence, special means, both magnetic and mechanical, which were described in detail, had been devised for this purpose. The results of the borings showed that the general indications of the strata were at right-angles to the directions of the chief axis of the Weald. On the same day the Mechanical Science Section dealt with the field telegraph in Chitral, which showed how rapidly and efficiently temporary telegraphs may be constructed. In the Botany section, Mr. H. Wager dealt with the relations existing between bacteria and disease, which contained practically nothing new; and by Wednesday several of the sections had concluded their work, though in the Mathematical and Physical Science a few papers were read. They dealt principally with subjects relating to chemistry and magnetism. Mr. E. H. Griffiths described an apparatus for standardising high-temperature thermometers.



Wall Paper designed for Messrs. Hayward & Son by Mr. John Belcher.

WALL-PAPER DESIGNS.

THE designs by Mr. John Belcher and Mr. Beresford Pite illustrated herewith, are prepared for execution with printed outlines, and hand colouring and shading by stencils with water colour, a process recently introduced by Messrs. Hayward & Son, of 88, Newgate-street. The obvious difficulty of barging the shaded edges of two pieces of paper together, in order to obtain a continuous and unbroken effect upon the wall, has been obviated by Messrs. Hayward's patent joint for wall-paper hangings.

THE INFLUENCE OF POETRY ON ARCHITECTURAL DEVELOPMENT.*

BY G. L. SUTCLIFFE.

ALTHOUGH in its early stages poetry is akin to religion, and, indeed, a part of religious literature, it soon slips its leading-strings and follows its own fancy whithersoever it listeth. Men begin to love poetry for its own sake, and poets strive more and more for beauty in feeling, thought, and form, so that at last poetry is called a fine art, and takes rank with architecture, sculpture, painting, and music. The influence of poetry on the development of architecture is specially interesting, because poetry is the only branch of literature which has been admitted within the æsthetic pale.

The beauty which is admired in one art has, it has been said, affinity with the beauty of all the others, and, as a corollary to this, the same general principles govern one and all. Whether the latter statement be true or not need not be discussed here, but it may be admitted that it is at least partially true. The sense of fitness and the quality of restraint, which the Greeks possessed in so large a degree, are exhibited as well in their poetry as in their buildings and statuary. There is no tawdriness or fustian either in their dramas or their temples. The poet and the architect

express themselves with equal clearness and simplicity of parts, and with equal refinement. The delicate shades and distinctions of the Greek language—the most expressive (it is said) of all languages—have their counterpart in the wonderful niceties and subtleties of Greek architecture. The Greek particles and turns of phrase have the same *raison d'être* and the same effect as the faint emphasis of their columns and the almost imperceptible curvature of plinths and cornices. There can be no doubt that architects profited by study of the masterpieces of Greek poetry, and endeavoured to give to their buildings, as far as possible, the qualities which delighted them in the literature. Speaking of "The Importance of Greek Art and Literature to the Practice of Gothic Architecture," the late William Burges said: "The great use of the study of literature to an architect is not only to educate him, but to give him that judicial power which is called good taste." And of all branches of literature none is more calculated to attain this end than the study of true poetry.

It is somewhat surprising to find that, while discussions on the nature and inter-relation of the various fine arts have been frequent during the last two hundred years, no special treatise appears to have been written on the relation of poetry and architecture. Poetry and painting have been frequently discussed—by Dufrenoy in France, Dryden in England, Lessing in Germany, and also by many subsequent writers. Perhaps it is because architecture and poetry are considered to be the two extremes of art that no special treatise has been written respecting them. Hegel, for instance, arranges the five fine arts in the following order, rising from the material to the spiritual:—architecture comes first and lowest; then follow sculpture, painting, and music; and the crown of all is poetry. There are certainly fundamental differences between the two arts: architecture has been termed non-representant, and mute; poetry representant and vocal; architecture is fettered by bonds of wood and brick and stone; poetry is free as the sunshine and the wind; architecture is yoked eternally with utility;

* From an essay submitted in competition for the Essay Medal of the Institute of Architects, which obtained the second place and a prize.



Wall Paper designed for Messrs. Hayward & Son by Mr. Beresford Pile.

ry goes her own sweet way and is an end to
elf.
ut architecture and poetry, although so different
many respects, have yet much in common, for
architecture never attains surpassing excellence
when the star of poetry is in the ascendant.
ubitably, the first steps of architecture are
d-in-hand with religion, but religion and ethics
do not suffice for the development of the
lest architecture, else would Jewish buildings
e been the delight of the world, and the archi-
e of the Early church, of the Reformation,
of all fanatical sectaries be among the
thiest. Something more is required than
ous attachment to a faith and eager fulfilment
its duties; and what is required is expressed
the word *culture*—not culture pampered to
minacy, but a manly development of faculty
broadening of sympathy. It is only, to use
these Arnold's terms, when Hebraism is
tured with Hellenism, that architecture rises
supreme excellence. Religion still remains
motive power, but culture controls it, and as
ardener, swaying the forces of nature, dupli-
es her beauties and leads her to out-rose the
e, so culture adds grace and beauty to the
ndeur and mass of sacred architecture.
f we turn to the Egypt of the eighteenth
d nineteenth dynasties—the great period of
gyptian architecture—we find that religious
ature has ceased to be without a rival. Poetry
taken a prominent place. The songs of
mph written in honour of the victories of
thmes III., of Seti I., and of Ramesses II.,
ess undoubted power and an Eastern wealth
imagery. The sculptor's rhapsody on
ompleting the colossi of Amenhotep's vast
ace-temple shows the development of lyrical
ression. The masterpieces of Pentaur,
kabu, Nebsemen, Enna, and others—Raw-
on declares—afford pleasure even to the
dern reader. In Babylonia a long train
poetry, including the epic of "Gishhubar"
twelve books, the poem on "The
cent of Ishtar," and many others, preceded
full development of architecture. The de-

velopment of poetry can be more clearly traced in
Greece,—from the great Epics ascribed to Homer,
through the Elegiac, Iambic, and Lyric verse of
Archilochus, Sappho and Anacreon, Simonides
and Pindar, to its culmination in the Attic drama.
And during all the early stages of development
the poetry was of a higher quality than the con-
temporary architecture. When Homer wrote
there were no temples of importance, probably
none at all. Sappho's songs, "of incomparable
melody," rang in men's ears, while architecture,
as witness the old temple at Corinth, was rude
and clumsy. Simonides, an old man of seventy-
six, earned his greenest laurels during the years
of the Persian invasions, when Athens was a
waste of charred timbers and blackened walls.
Pindar alone of these great singers, lived on into
the Periclean age, and he, four-score years old,
sang his swan-song at least a lustrum before the
Parthenon was finished. It was a "poetical
basis on which the culture of the Greeks reposed.
The spiritual elevation, the true liberality, the
nobleness of conception which belonged to the
best Greek character are in some measure fruits
of that long sovereignty which great poetry had
held over the race."* It was with imagination
quickened and taste refined by contemplation of
this wonderful heritage of verse, and by listening
to the new creations of the great living dramatists,
that Ictinus and Pheidias, Callicrates and
Mnesicles designed those buildings which have
made the Acropolis of Athens the most famous
rock in the world.

The indigenous Roman architecture of her
early kings, and the ballads and sacred literature
of the same period, have alike perished and
neither the architecture nor the literature which
flourished when Rome was in the zenith of her
power, can really be considered native creations;
but even in Rome, the cultivation and apprecia-
tion of poetry, as in Greece, preceded and assisted
the development of architecture. The greatest
figures in Latin literature are poets. Rome's
greatest dramatists, Plautus and Terence, died

when Roman architecture had scarcely begun to
exist. Satiric and other verse accompanied and
followed the drama, and in the next century, the
brilliant lyrics of Catullus led up to the golden
age of Latin poetry, when, in the hands of Virgil
and Tibullus, Horace and Ovid, epic, lyric and
elegiac verse alike, approached perfection of style
and expression. It was in the latter part of this
golden age of poetry, that Rome changed from
brick to marble, and that Roman architecture
flourished in its highest purity.

Byzantium produced little poetry or even litera-
ture of any kind, above mediocrity. "Not a
single composition of history, philosophy, or
literature, has been saved from oblivion by the
intrinsic beauties of style or sentiment, of original
fancy or successful imitation." Such is Gibbon's
dictum.* Certainly the fourth-century was
utterly barren of poetry, but in the fifth cen-
tury—the century preceding the age of Justi-
nian—some taste for it does appear to have
arisen, for a few new works were written,
such as the epics of Nonnus and Synesius,
while the poem of Musaeus on the story of Hero
and Leander, composed probably about 500 A.D.,
is described by Professor Jebb as "of much
beauty." At the best, however, the appreciation
of poetry was slight. Men's intellects were
engaged in ecclesiastical controversies and dis-
quisitions, to the exclusion of higher literature,
and the narrowness of soul begotten of such
mental occupation is visible in the poverty of
invention which left the exterior of St. Sophia
so ugly and chaotic. The same poverty of
invention and archaic stiffness of pose which
characterise Byzantine architecture and figure-
drawing of the age of Justinian, are apparent in
the buildings of Western Europe to a much later
date. Even the elaborate Cathedral of Pisa,
belauded as it has been, half amuses by the
naïveté of the design of its western front, while
the adjacent campanile is almost childish in its
repetition of story on story. If we turn to France
as "the cradle of Gothic architecture," we find
that a wealth of rude epic poetry, gathering
around the names of the Christian champions,
Clovis and Charles Martel and Charlemagne,
partly preceded and partly accompanied the
development of the Romanesque style, while the
first appearance of the brilliant lyric poetry of
the Provençal troubadours and the narrative
poetry of the northern trouvères preceded the
dawn of the new style of architecture by nearly
half a century. And as the poetry of France
shed its influence on all the neighbouring
countries, and roused them to emulation, so the
influence of France can be traced in the Gothic
architecture of England and Spain, Germany,
and Italy. And the age which saw the culmina-
tion of Medieval poetry in the great epic of
Dante, the songs and sonnets of Petrarch, and
the poems of our great Chaucer, has been styled
the age of perfection (although not of greatest
activity) of Medieval architecture.

The growth of native poetry is a necessary
factor in the development of the noblest archi-
tecture, and the correlated truth may be
predicated that the assimilation and imitation of
an alien nation's poetry lead to the introduction
of the same nation's architecture. Assyria
borrowed both her literature and her architecture
from Babylonia. The transplantation of Greek
architecture to Roman soil followed the transla-
tion and imitation of Greek poetry, and was
largely due to it. The delight in the culture of
Greece, which sprang from study of her literature,
impelled the Romans to study and strive to
imitate the more laborious beauties of her archi-
tecture. Before Republican Rome fell under the
spell of Athens she had neither architecture nor
literature of value. Indeed, while the Republic
was in its noblest vigour Romans were too rough-
and stern to take pleasure in the Fine Arts. As
late as 187 B.C. Marcus Porcius Cato opposed the
granting of a triumph to M. Fulvius Nobilior,
partly on the ground that "he cherished literary
tastes, and even kept poets in his camp!" And
in the same century the erection of permanent
theatres was forbidden by statute. But the tide
of Greek culture could not be stemmed even by
Cato and the Senate. Livius Andronicus, a
Greek from Tarentum, had introduced transla-
tions of Greek plays. He, a Greek, has been
called the father of Roman dramatic poetry.
Plautus and Terence, who are the chief Latin
dramatists, were directly "inspired" by Greek
works. Yet even at the death of Terence
(159 B.C.) there was no architecture; all the
buildings in Rome were of brick or local stone;
there was probably sound construction, but

* Jebb: "Greek Literature."

* "The Decline and Fall of the Roman Empire."

nothing was heard of architecture as a fine art.* Macedonia became a Roman province in 146 B.C., and the imitation of Greek literature issued at the first opportunity in imitation of Greek architecture. But architecture could not flourish during the ferocious civil wars of the first seventy years of the first century B.C. The years which saw the repeated struggles of Marius and Sulla, the gladiatorial war, the conspiracy of Catiline, the fierce strife between Pompey and Cæsar, the fight for existence of the second triumvirate, and the crowning struggle of Antony and Octavianus, were not apt for architectural development. In the brief rule of Julius Cæsar some progress was made, but it was not until Octavianus became Augustus that Rome began, in earnest, that course of building which had, for ultimate issue, the development of complex vault and soaring dome.

Literature, however, had not been silent during the period of architectural barrenness. Lucretius put the Epicurean philosophy into verse. Varro and Cicero wrote moral, political, and philosophical essays, and Catullus, "the greatest lyric poet of ancient Italy, and one of the greatest poets of all ages," after close study of Greek poetry, wrote his playful society-verses and sang his passionate exquisite love-songs. In the closing years of the long civil wars Virgil gave his "Eclagues" and "Georgics" to the world, and Horace wrote some of his charming "Odes"; the debts which these poets owed to Greek works are too great to be overlooked. When Octavianus became Emperor, the fruit of the long intimacy with Greek poetry which the Romans had enjoyed, appeared in art. All kinds of buildings were now erected—temples both rectangular and circular, the theatres of Balbus and Marcellus, the baths of Agrippa, triumphal arches, the emperor's mansion and the Palatine library, the emperor's tomb (built during his lifetime), and numberless large and ornate private houses. If Rome had not fallen under the spell of Greek poetry, it is more than probable that she would not have adopted Greek architecture.

But the most important revival of architecture which the world has yet seen is undoubtedly the Italian Renaissance, which commencing in the fourteenth reached its culmination in the fifteenth century. The Renaissance was essentially a literary movement, and its origin may be traced back to the great Mediæval poet, Dante, who lovingly acknowledged Virgil as his master. Petrarch, who was not content with writing Italian poems but showed his appreciation of classical literature by composing a Latin epic on "Africa," owed much of "his exquisite elegance of diction" to "the perpetual study of Virgil";† and Boccaccio, at Petrarch's request, translated both the "Iliad" and "Odyssey" into Latin. The fountain-head of the Italian Renaissance is found in the appreciation of classical poetry, but the stream was rapidly swollen by study of every scrap of classical literature on which hands could be laid.

While it was impossible that in later centuries there could be any revival of classical literature corresponding in magnitude with that which took place in Italy during the fourteenth and fifteenth centuries (for the loss of ancient learning has never been as complete as it was in the dark and middle ages), it is true that the appreciation of classical literature has waxed and waned. And in our own country we find that the period in which Latin poetry was held in highest honour—when quotations from Latin poets were in all men's mouths, and when English poets took keenest pleasure in Latin polish and artifice of style—was the period when Roman architecture held undisputed sway. The age of Dryden, translator of Ovid, Lucretius, Horace, Juvenal, Persius and Virgil, was the age of Wren. The age of Pope,‡ translator of Ovid and imitator of Horace, was the age of Hawksmoor, Vanbrugh (himself a dramatist), and Gibbs.

The revival of Greek architecture in England has been boldly ascribed by Burges to the effect of poetry, although not to a revival of Greek poetry. "Although Greek architecture," he said in 1876, "was known and described a hundred years ago, it was little practised until Lord Byron published his poems and made us all Philhellenists." The same speaker declared that the "quasi-Mediæval romances" of Sir Walter Scott

"caused the Gothic revival to set in; but this statement is undoubtedly erroneous, for Horace Walpole's villa at Strawberry Hill was built in the ten years from 1760 to 1770, about half-a-century before "Waverley," the first of Scott's novels, appeared. The germ of the Gothic revival must rather be looked for in Defoe, whose revolt from the artificiality of the current literature might well give men occasion to reflect upon the artificiality of the architecture of the period. But perhaps the nearer cause of the revival may be found in the novels of Richardson, Fielding, and Smollett, all of which, except two, were published before 1754, six years at least before Walpole's villa was begun. Probably, however, the secular literature which most aided the spread of the Gothic revival, was Percy's celebrated collection, "Reliques of Ancient English Poetry," which achieved instantaneous popularity on its publication in 1765. This and the "quasi-Mediæval" poetry of Chatterton and Macpherson might well draw the attention of men to Mediæval architecture. Nevertheless, the Gothic revival would never have attained the importance it afterwards assumed, had it not been for the great revival of religion which, beginning with the fervent preaching of Wesley and Whitfield, gradually permeated all ranks of society from the lowest to the highest. The Gothic revival was essentially a religious movement, although not uninfluenced by secular literature. Indeed, it was not until a new era of poetry had fully dawned, that the progress of the new style was assured. The splendid body of verse which marked the close of the eighteenth century and the opening of the nineteenth, and which included the works of Burns and Scott, of Wordsworth and Coleridge, of Byron, Keats and Shelley, showed the full tide of the reaction against the previous artificial style based on classical models. Poets reverted to Nature for their inspiration, and architects returned to a style which seemed more adapted to English needs than did the columned styles of Greece and Rome. The principles of truth and sincerity which animated the new literature, were ardently advocated and practised by the enthusiasts of the new architecture.

But the force of that burst of poetry which marked the opening of the century, has not yet expended itself. A milky way of brilliant names has wound along the century, from Wordsworth and Coleridge to Tennyson, Browning and Arnold, to Rossetti, Swinburne and Morris, while a host of minor lights have shone between. The gradual change from mere archeological architecture to a style which cannot be labelled with the name of any preceding style since it partakes of the nature of all, is largely due to the stimulating and refining influence of this wonderful train of poetry. And it may be that only the end of the twentieth century will see the full development of what may be called the Romantic style of architecture since it owes so much to the Romantic School of Poetry.

The effects of poetry, which we have hitherto considered, have been more or less indirect, but one branch of poetry has had a most direct influence on architectural development, to wit, the drama. From this has sprung the long series of theatres, extending from the famous theatre erected at Athens in honour of the god Dionysus soon after 500 B.C., through all the theatres, and (indirectly) the magnificent amphitheatres, of ancient Rome and her wide-extended provinces, to the ornate theatres and opera-houses of modern cities. It must be confessed that the modern drama does not appear to have a beneficial influence on architecture; the reason is not far to seek—modern theatres are usually commercial undertakings, no more.

Poetry, however, *qua* poetry (with the exception of the drama) has really no directer influence on architectural development than the promotion of culture and the quickening of imagination. Poets' descriptions of architecture are almost invariably vague or incorrect, and quite useless as aids to design. Indeed, it is in their very vagueness that their beauty and stimulus inhere. There are few nobler lines than Coleridge's wonderful dream-fragment—

"In Xanadu did Kubla Khan
A stately pleasure-dome decree,
Where Alph, the sacred river, ran
Through caverns measureless to man
Down to a sunless sea."

And yet, from an architect's point of view, how vague they are. Compare them with Thomson's careful description of Greek architecture, and little doubt will be felt as to whether this passage or that is more likely to gladden an architect

with visions of noble buildings, and to inspire with courage and patience enough to fix those visions everlastingly in stone.

"First, unadorned
And nobly plain, the manly Doric rose;
The Ionic tent, with decent matron grace,
Her airy pillar heaved; luxuriant last,
The rich Corinthian spread her wanton wreath.
The whole so measured true, so lessened off,
By fine proportion, that the marble pile,
Formed to repel the still or stormy waste
Of rolling ages, light as fabrics looked
That from the magic wand aerial rise."

The poet's business is not to catalogue beauties of a building, or to make an inventory of its details, but rather to convey, clearly, forcibly, the emotions which the building excites in the heart of the beholder. Then most do quicken the imagination of the architect.

Space, however, would fail if we were to enter into this delightful region of poets' architecture and bare mention only can be made of them: that the rulers who have shown the keenest appreciation of architecture have usually been lovers of poetry if not poets themselves. The name Seti I. and Rameses II. in Egypt, of Assurbanipal in Assyria, of Pisistratus and Pericles in Greece, of Augustus at Rome, of Harun Rashid at Bagdad and Abdurrahman III. at Spain, of Cosmo and Lorenzo de Medici at Florence, of Francis I. in France, and numbers, spring to mind as patrons both of poetry and architecture. The lover of poetry is like a lover of art.

G. L.

MEMORIAL TO THE LATE C. J. JACSON.

THIS memorial, in the form of a medallion portrait with emblematical figures in the angles of the framework, has been erected in the H. Free Library at Preston. The sculptor is E. Roscoe Mullins, the architectural setting is by Messrs. James and Arnett Hibbert, and the framework was executed by Messrs. Fattess Manchester.

The portrait and the angle figures are executed in statuary marble; the two upper figures symbolise Virtues, and the two lower ones angels in prayer. The framework is executed in giallo antico. The size of the whole is 5 ft. 4 in. by 4 ft.

As the photograph was taken a little from side, showing the outer framework in perspective and with no background of any kind, we have been unable to show the whole framework; the strong vanishing lines of the dark margin on the white background would have the effect of a crooked border; the reproduction shows the sculptural portion complete.

COMPETITIONS.

WEST HAM TECHNICAL INSTRUCTION COMMISSION.—The Technical Instruction Commission of the West Ham Town Council will meet on 20th inst., to consider the report of the assessor Mr. J. Macvicar Anderson, F.R.I.B.A., in regard to the seventy-three designs submitted to this competition. The designs will be on view at the Public Hall, Barking-road, Canning-Town (station), Canning-Town, Great Eastern way, from Saturday, September 21, to Saturday, September 28 inclusive, admission being by ticket which may be obtained on application to Town Clerk, Town Hall, West Ham, E.

SEWERAGE SCHEME, GREAT AYTON.—Parish Council of Great Ayton and the Chairman of the District Council, acting together as Parochial Committee, have for some time under their consideration the subject of a thorough system of main sewerage for the village. To ensure the greatest efficiency they offer a premium of twenty-five guineas for the best competitive scheme, and, in response, five entered into the competition. Mr. T. Stainborough, C.E. (the Engineer and Surveyor the Estor Urban Council), was called in as adviser, and eventually the scheme by Mr. R. Taylor, of Newburn-on-Tyne, was adopted. The Mayor's scheme is framed on an estimated cost of 2,990l. (including the plan of the Ives's system of filtration).—*Leeds Mercury*.

ARCHITECTURAL SOCIETIES.

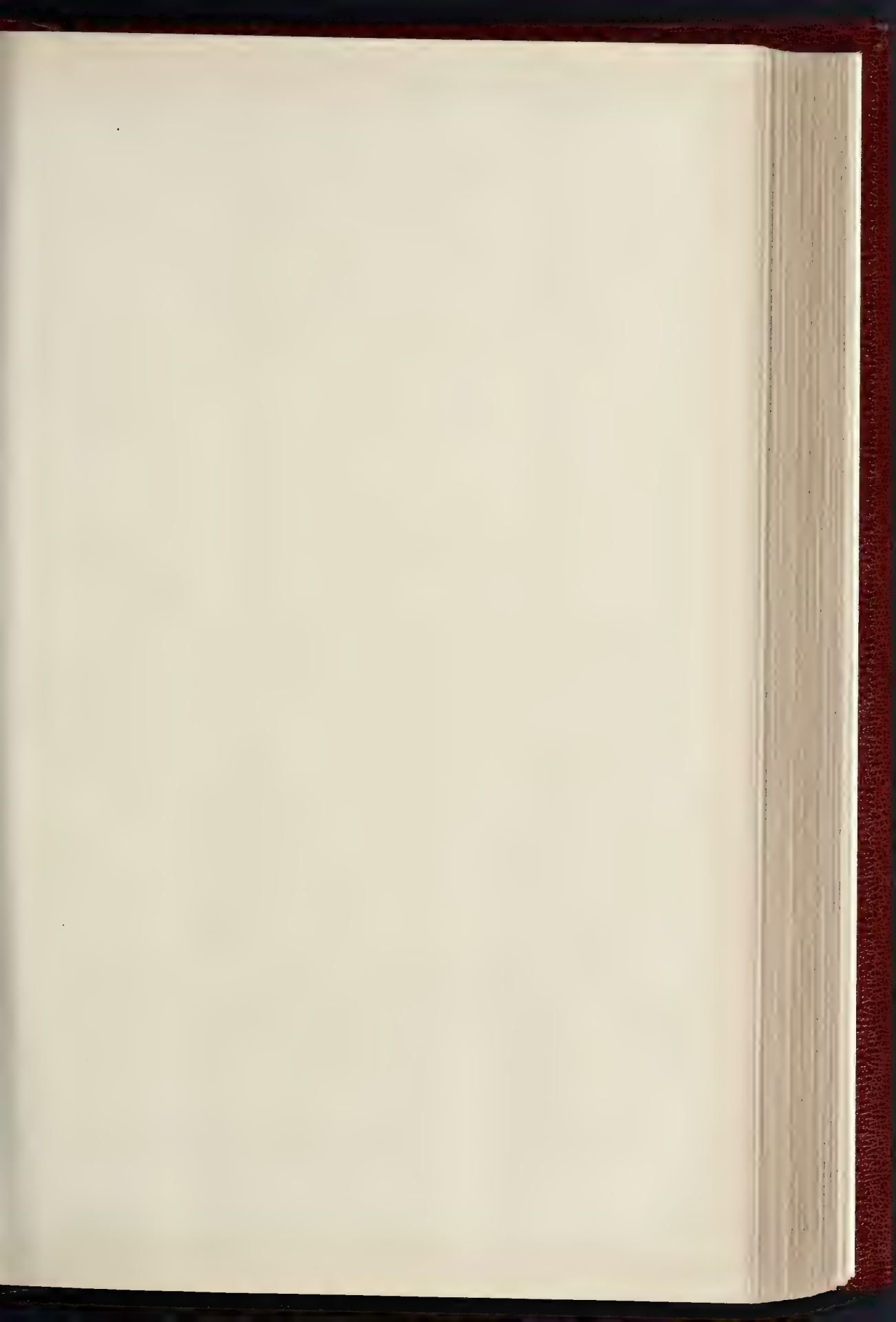
THE GLASGOW ARCHITECTURAL ASSOCIATION.—A meeting was held on Tuesday evening last in the new rooms, 187, Pitt-st., when Mr. Alex. McGibbon, architect, read a paper on "Motive and Material in Architectural Design."

* Ferguson: "History of Architecture," i.

† Hallam: "Europe during the Middle Ages."

‡ Pope, it is true, translated both the Iliad and Odyssey, but he never entered into the spirit of the Greek poetry. His translation has been styled "a study in modern Homeric performance in the whole compass of our poetry."

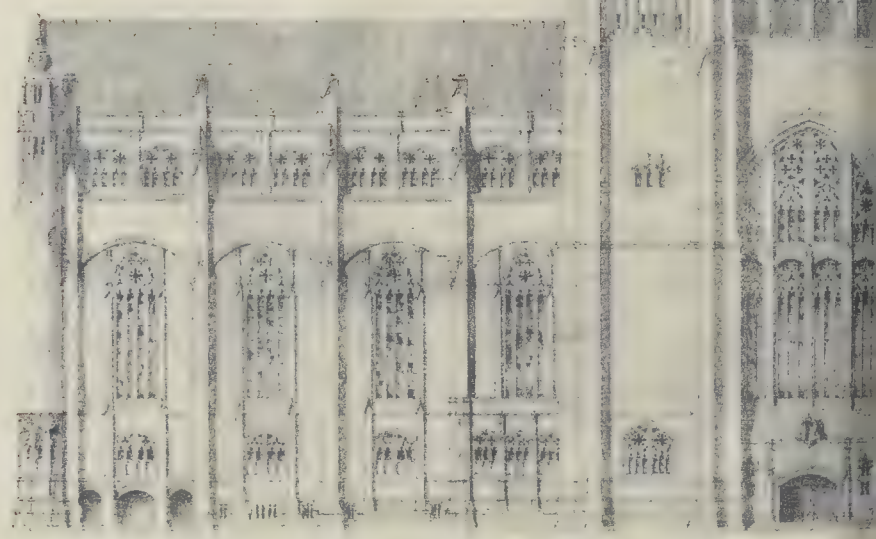
—[Craik: "History of English Literature and Language," II.]



AN ELEVATION OF THE TEMPLE
OF A LATER CATHEDRAL

EXTREME EXTERIOR LENGTH 100
EXTREME EXTERIOR BREADTH 40
HEIGHT OF EXTERIOR WALLS 100
HEIGHT OF EXTERIOR WALLS 100
HEIGHT OF EXTERIOR WALLS 100

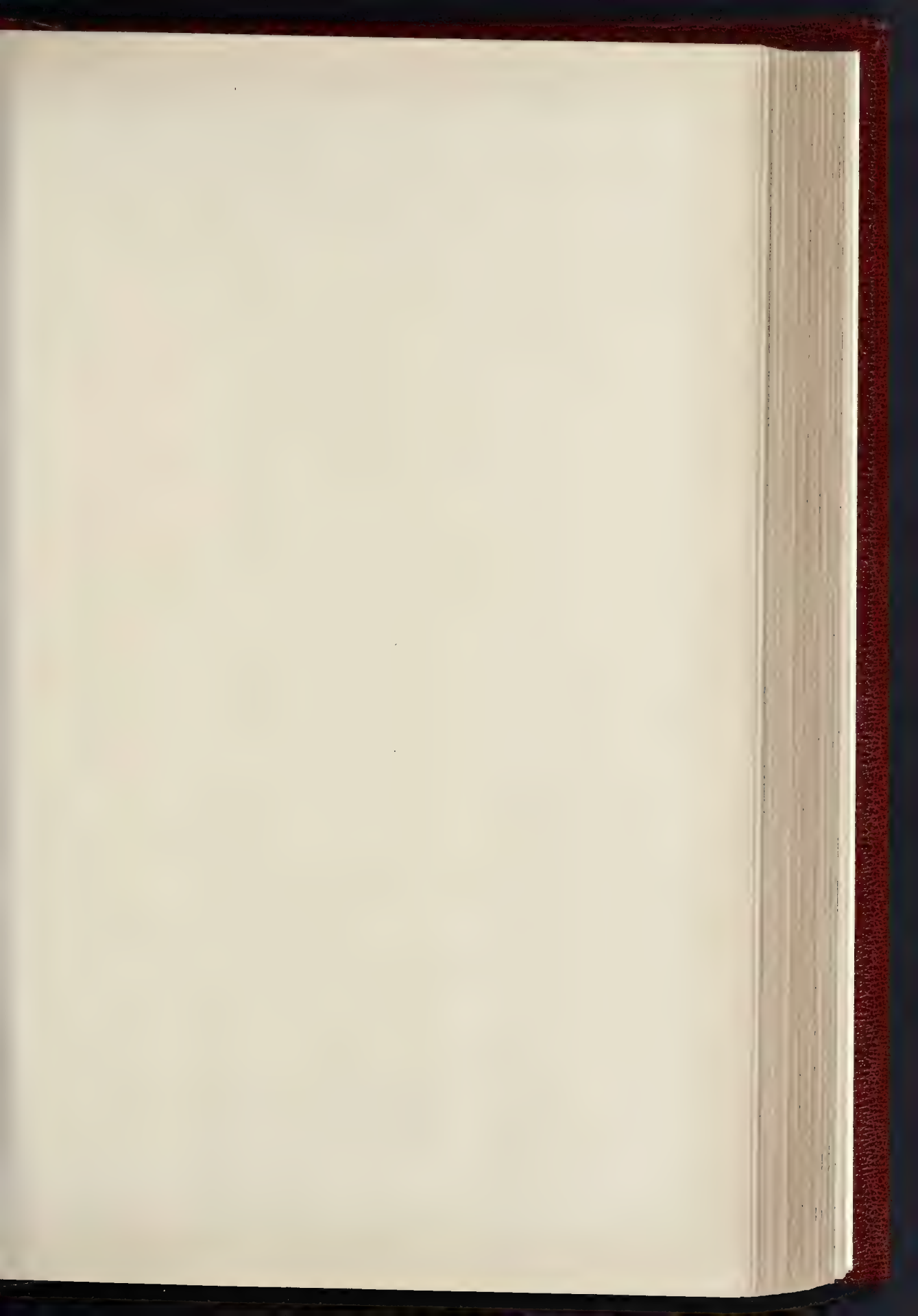
NORTH ELEVATION





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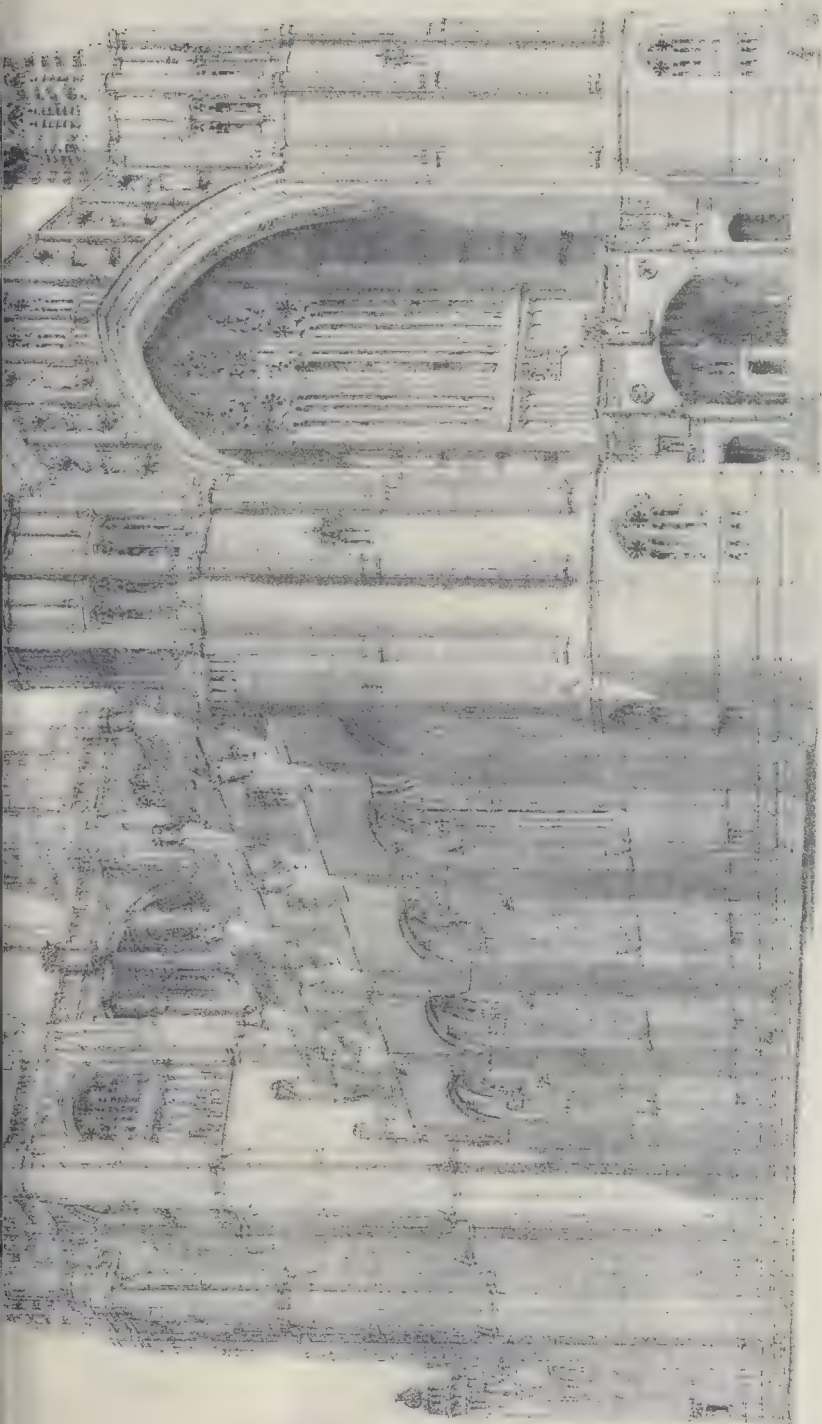
R. H. L. Smith Architect
12. Tipton St. London

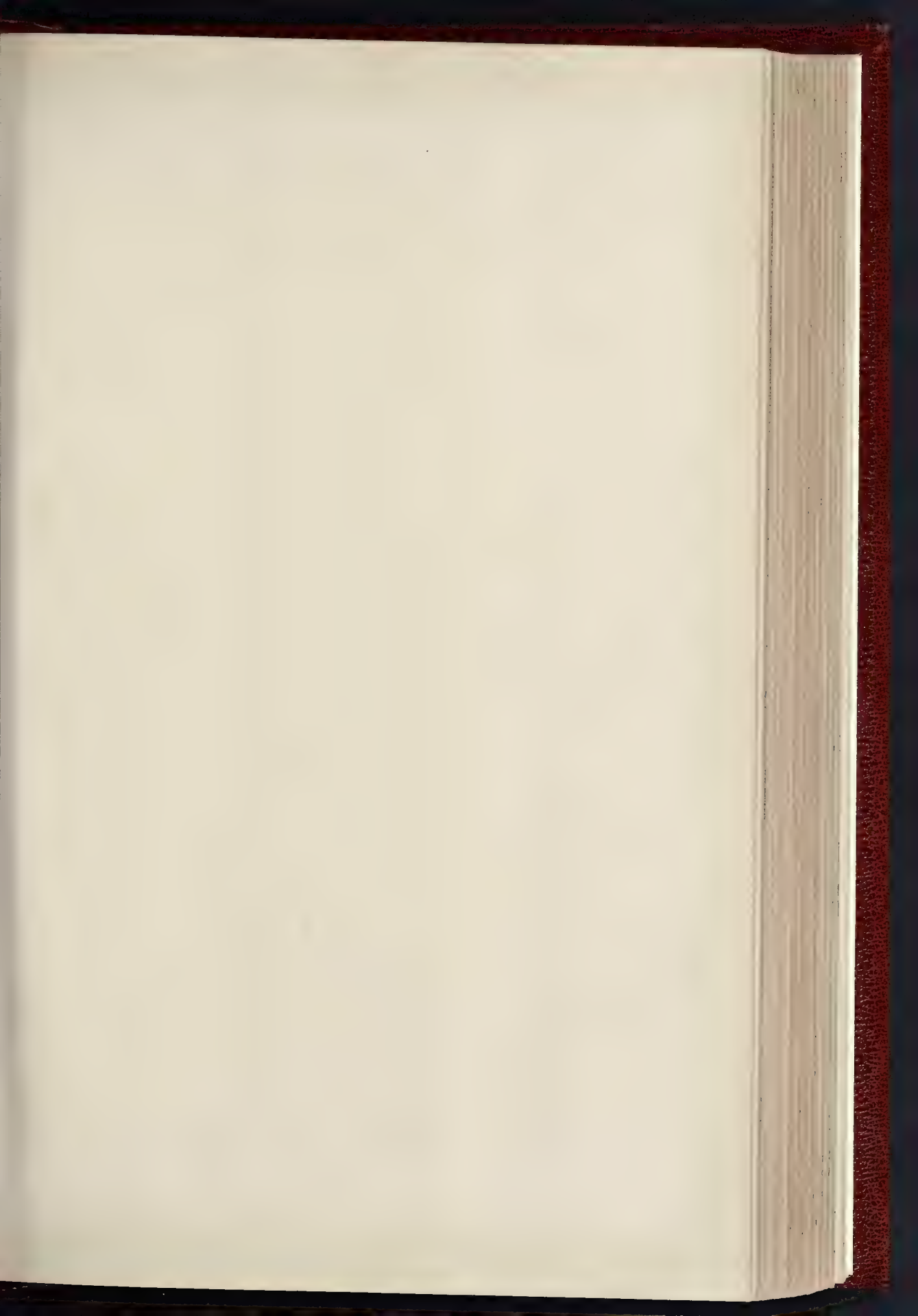


NATIONAL INTERIOR LAMPS
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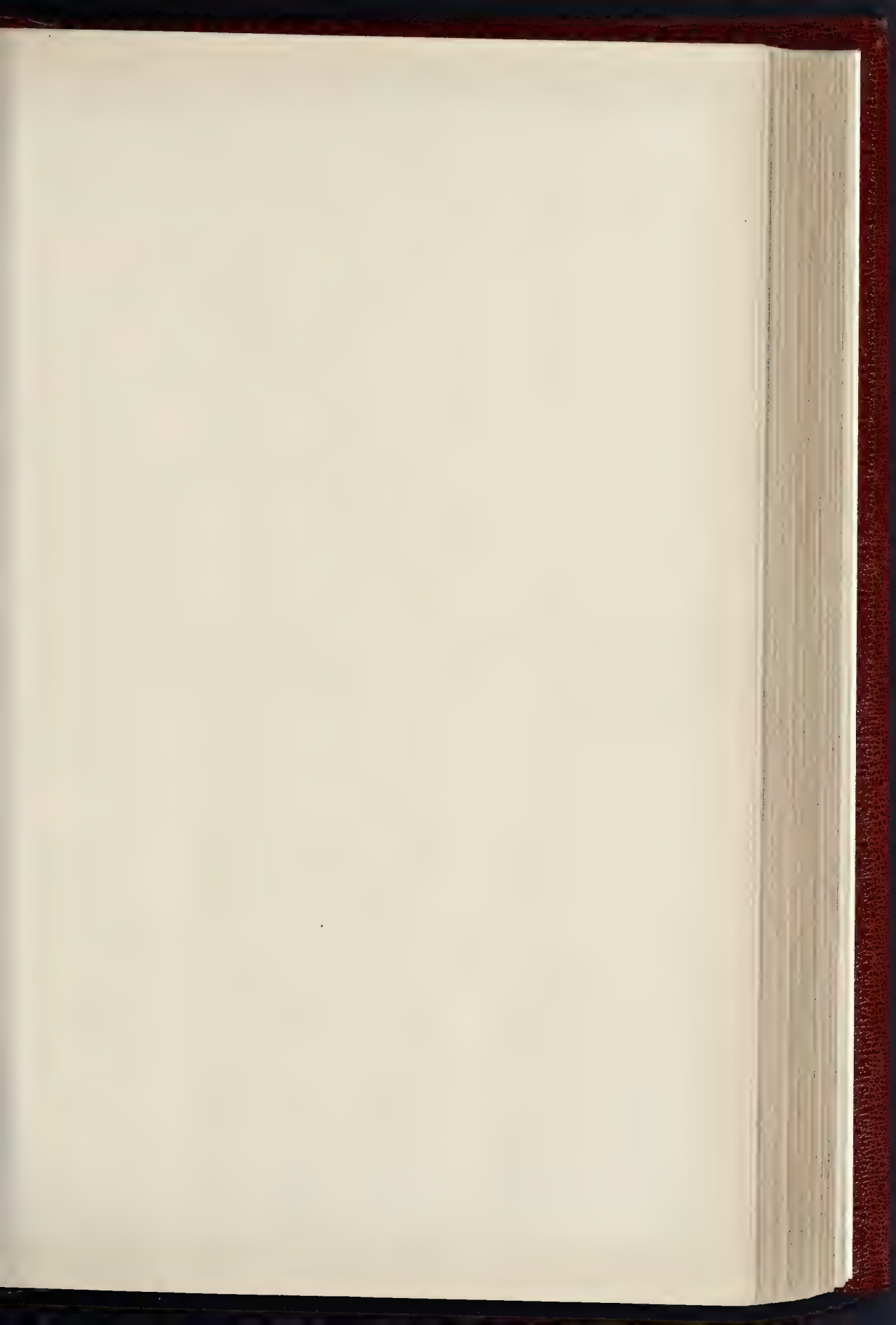




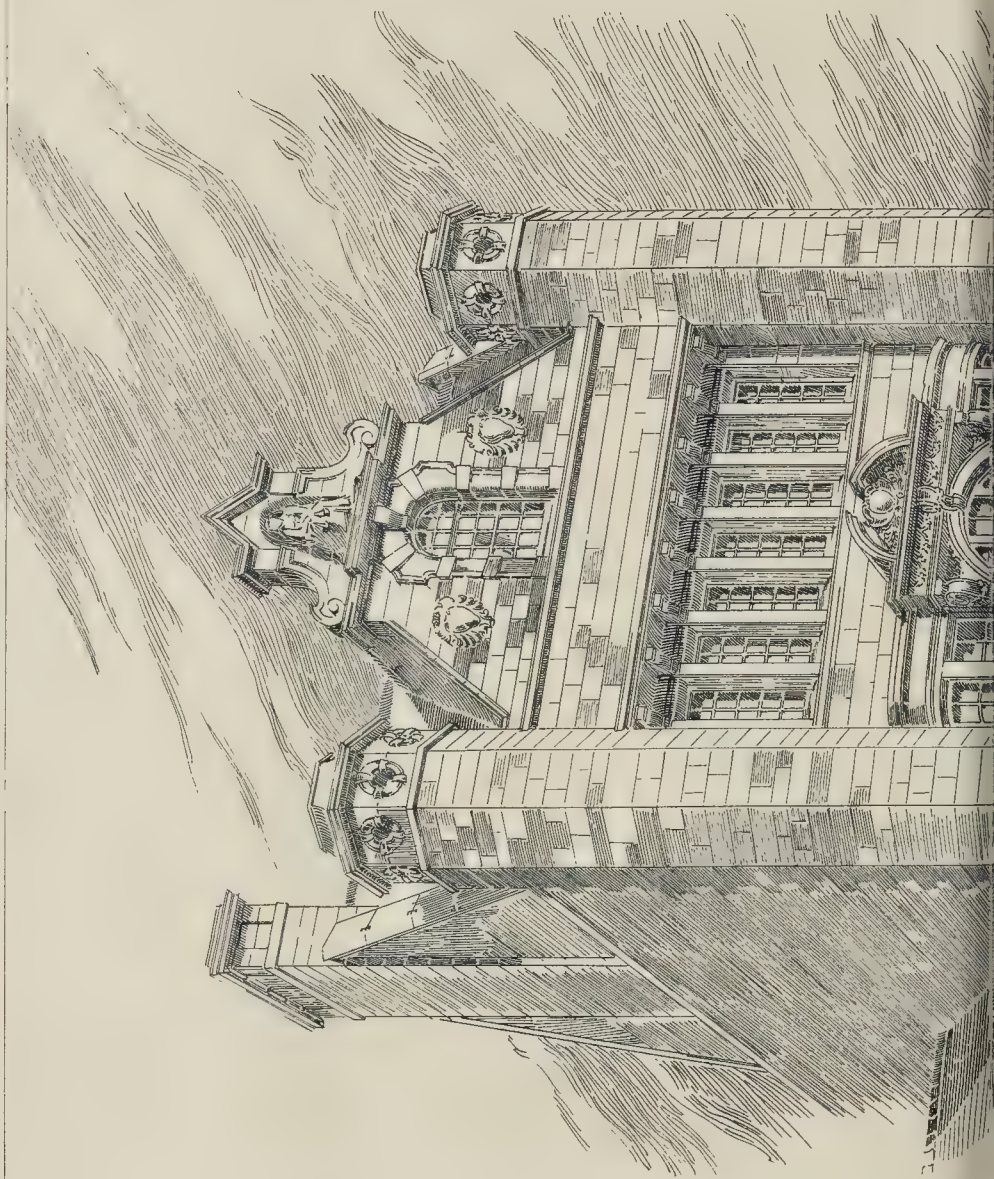
ABBAY GATE, BURY ST EDMUNDS



NORMAN TOWER, BURY ST EDMUNDS



THE BUILDER, SEPTEMBER 21, 1895.



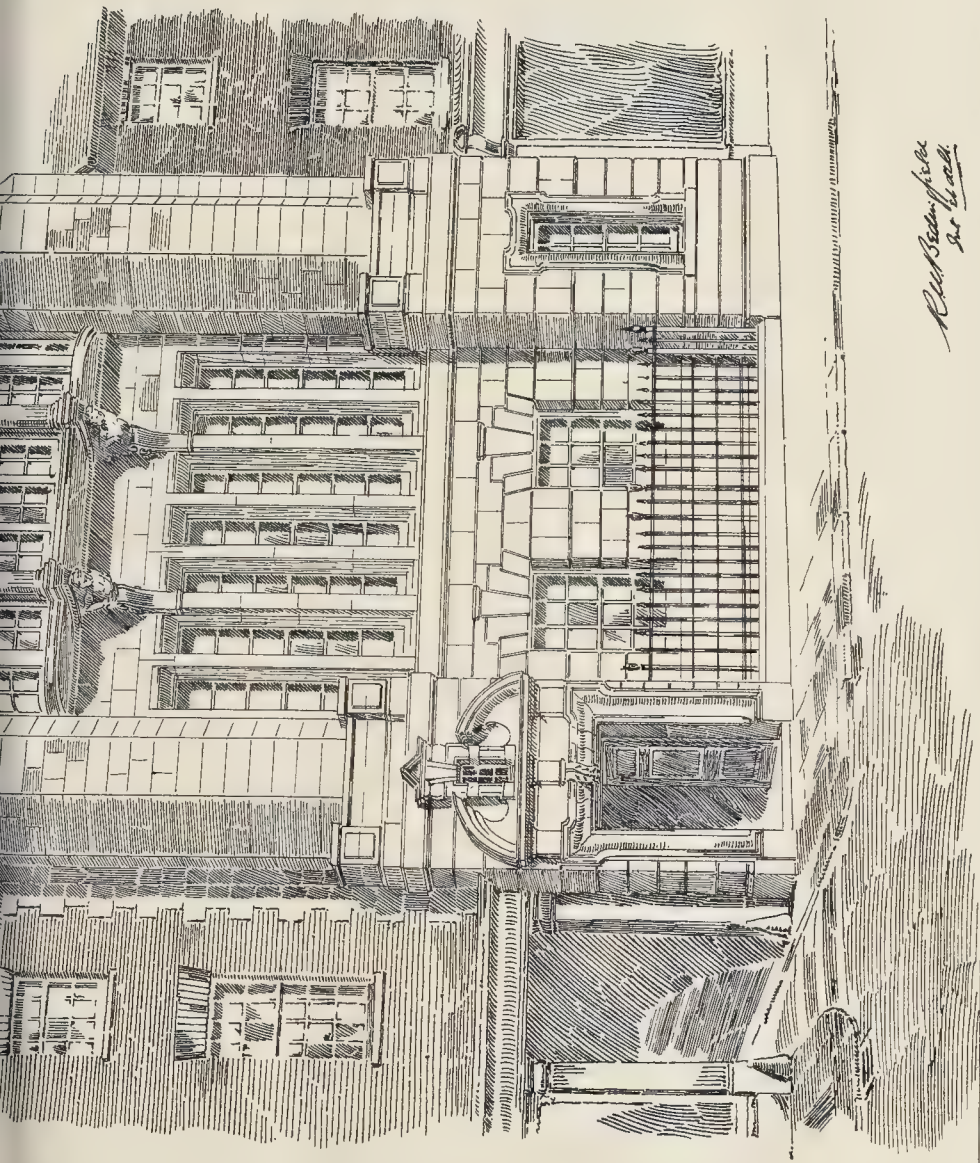
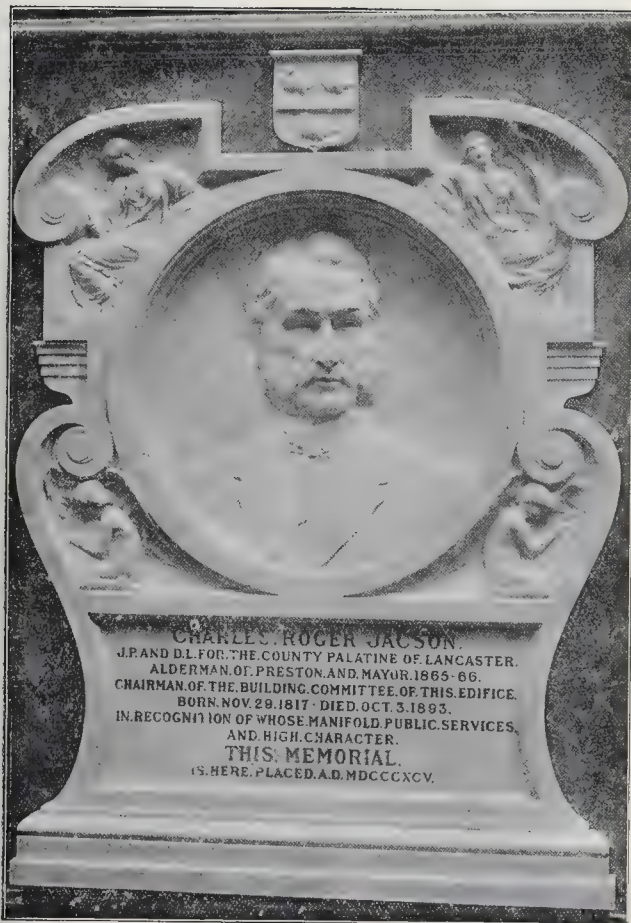


PHOTO. J. H. O. SURGEON. 1/4" x 1/2" EAST. HADING STREET. LONDON. AND C.

R. W. Bedingfield
Arch.

A STREET FRONT. MR R W BEDINGFIELD, A.R.B.A., ARCHITECT



Memorial Tablet in Preston Free Library.—Mr. E. Roscoe Mullins, Sculptor.

the paper was a historical inquiry into the relative influence exerted on architecture by motive and material respectively. The former was considered the stronger, although in particular cases many times the nature and locality of materials dominated the style. Forecasting the coming condition, the essayist judged that whatever new materials may emerge, the materials that have gained favour in the past will never be ousted from their position, and the forms of the past will be perpetuated. Mr. George Copland opened the discussion, which was freely indulged in, and the customary vote of thanks was passed to the lecturer for his able paper.

DIATOMITE.

THIS is the name given to what several of our contemporaries have called a new material, which is now being used in fireproof construction, also for covering steam boilers, steam pipes, preventing damp and dry rot, isolating engine-rooms, and making, and for antiseptic and kindred purposes. Diatomite from the Island of Skye has recently been used in concrete floors at the offices of the *Glasgow Herald*, in such a manner as to elicit forth much commendation. But it is a mistake to regard it as a new material; it has only for the present been re-christened and put to new purposes. It is far better known under its German appellation, kieselguhr, or fossil meal. It may be described, shortly, as consisting of myriads of skeletons of extremely minute plants, which can only be seen by a high power of the microscope. These skeletons are entirely siliceous, and the particular form of silica resembles flint; it is not crystalline, or at least it does not display all the optical properties characteristic of quartz; but in

general it is a very pure siliceous earth. Apart from the uses already alluded to, diatomite (or kieselguhr, as we should prefer to call it) would make a first-class fireproof brick where one of extreme lightness is required. The principal objection to such bricks is their comparative friability and softness. They are, as a rule, very absorbent, but are good fire-bricks for all that. They should be used only in positions where there is not much friction.

The material employed at the newspaper offices alluded to is a mixture of diatomite with concrete, and is designed to meet the necessities of modern fireproof construction—viz., strength, lightness, deadening sound between floors, and absolutely efficient resistance to the greatest heat possible in any warehouse fire, this being secured, says the patentee, after a long series of experiments and tests in the successful practical application in the composition of the concrete, &c., of a very high non-conducting material, now known to have been used by the Romans. It is stated that the present is the first instance since Roman times, however, that diatomite has been made practicable as a material for building construction. The test applied at experiments conducted at the office on the 11th inst. was a severe one. A slab of ordinary concrete and another of the new material, each 29 in. by 26 in. and 7 in. thick, were placed upon a smith's fire with double tye irons, and a powerful blast applied constantly for eighty minutes by means of two 30-in. bellows. After the concrete had been subjected to the blast for eighty minutes both slabs were removed from the furnace, and cold water thrown upon the surfaces which had been exposed to the heat. They were both afterwards struck with a sledge-hammer. The ordinary con-

crete yielded to the second blow, and it was found that the heat had penetrated $4\frac{1}{2}$ in. The diatomite slab did not break until the sixth blow, and in this case the heat had penetrated only $3\frac{1}{2}$ in.

Mr. Councillor Sinclair, who was present, remarked that, in consequence of the fireproof character of the new building, the proprietors had obtained a considerable reduction in the rates of insurance. The concrete of all the floors was mixed with diatomite.

From the above experiments we should think that this fireproof flooring will answer its purpose very well. There is always the danger, however, that such material will not answer so well on the large scale as on the small. When a "fireproof" building is subjected to a conflagration it frequently happens that the barrier is rendered useless from imperfect or incomplete construction. We shall be glad to learn that with its wider application diatomite is, in reality, all that is claimed for it.

We do not gather the extent of these deposits in the Isle of Skye. Diatomaceous earth (or ooze) is not particularly common, and there is not much of it in the British Islands. In Ireland it is forming on the borders of certain lakes at the present day, but the beds cannot be very thick. Its use is largely dependent on its relative purity, which is an unknown quantity in many instances. In the manufacture of fire-bricks it is not difficult to see that some of the German kieselguhr contains a fair proportion of iron. Samples of this compared with the material from the neighbourhood of Portree, are not quite so white as the latter, which could be easily mistaken for a form of amorphous lime, or powdered chalk at first sight. We are not personally acquainted with the Skye deposits, but an examination of the material would seem to point to a recent origin, such, for instance, as may be produced in bogs, at the present day.

Illustrations.

A NINETEENTH CENTURY ATTEMPT AT A LARGE CATHEDRAL.

THE two fine drawings under this title, by Mr. A. H. Shipworth, were exhibited at the Royal Academy this year.

As the design is a study merely, and there are no practical details to be given as to its execution, the author prefers to leave it to speak for itself, without any further explanation than the drawings themselves afford.

The subject of modern cathedral design is briefly considered in the first article in this issue, partly in reference to this design.

ABBEY GATEWAY AND THE NORMAN TOWER, BURY ST. EDMUND'S.

BURY ST. EDMUND'S is one of the places to which excursions were arranged in connexion with the British Association meeting at Ipswich. It may therefore be of interest to give illustrations of some of the Mediaeval remains which form the chief interest of the place.

The two gateways of which illustrations are given are the most important of the remaining architectural features of Bury St. Edmund's. The two fine Churches of St. James and St. Mary afford good examples of Suffolk Perpendicular work, and the scanty remains of the great abbey church, which exist only sufficiently to enable its immense size to be inferred, render evidences of what was one of the most noteworthy of the ecclesiastical buildings of East Anglia. The old Norman synagogue, Moyse's Hall, recently restored and adapted to a modern use, has suffered in the process of adaptation.* While these buildings all afford objects well worthy of study, the two gateways have the advantage of at once arresting the attention of the visitor, not only on account of their great interest, but also by reason of the early date of the first of the examples, and the beauty of the workmanship of the other.

The Norman tower, now called "St. James's Gateway," and which serves as a belfry to the adjacent church, is a fine, bold Norman work, by far the most complete of all the gateways of the same date now remaining. While the examples at Bristol and Canterbury have lost their upper portions, here the walls are original at least up to the parapets. The battlements are modern, having taken the place of a cren-

* An illustration of the interior of this was given in the *Builder* for July 30 of this year, page 41.

lated parapet of fifteenth or sixteenth century date.

The primary purpose of the gateway was to give entrance to the west front of the abbey church, which was directly to the east. The precinct wall of the abbey ran left and right from the north and south walls. This fine gateway at present towers above the adjacent buildings and the steepleless church, and with the conical roof, which was doubtless the form of its original covering, it must have made an imposing composition with the enormous abbey church in the near background, the western steeple of which latter is well known to have been one of the most lofty in the kingdom. The view shows the south and the western faces, the latter being the principal one, abutting upon High-street. The porch, with its pedimented roof, is very similar to that of Kelsø Abbey. In the absence of documentary evidence worthy of acceptance, the period of its erection may be safely assigned to about the end of the first third of the twelfth century. The height is about 75 ft. from the modern level of the ground, the width of the front being very nearly 40 ft. The work, considering its date, is in a remarkable state of sharpness and preservation, showing how carefully the Norman builders selected their stone.

The second gateway, which projects from the line of the Abbey boundary wall, indicates how marked and complete is the difference of design and workmanship between that of the twelfth century and the middle of the fourteenth, when this structure was erected. A former gateway was demolished during one of the dissensions between the monks and the townspeople in 1327, and its re-erection appears to have been moderately soon after that event.

The view, which shows the western, or entrance-side, from the town, indicates also the position of the Abbey wall, part of which remains. It is composed entirely of cut stone, and the work is executed in an admirable manner, which relieves what would be otherwise the somewhat monotonous effect of the repetition of parts over one another of almost the same size and design. The angle-shafts were carried up higher than the battlements, but in no case do they remain.

The gateway shown in the view opens into a vestibule, the modern porticulis being in the ancient grooves. A flat arch beyond it opens into the gateway proper, the walls of which, left and right, are panelled in the form of traceried windows; and having a roof vaulted with diagonal and intermediate ribs with bosses at the intersections. On the walls are the arms of Edward the Confessor, the Duke of Exeter, Brotherton, Holland, &c.

The large arch in the eastern face, which led into the Abbey grounds, has no sign of any gate or door.

On the first floor is a large apartment with a fireplace, the principal window of which opens in the eastern wall. The present height is about 66 ft., the length being 64 ft. from front to back, the width of the front being about 40 ft.

A STREET FRONT.

THIS is a design by Mr. R. W. Bedingfield which was exhibited at the Royal Academy last year. It shows rather a bold and unusual treatment in the introduction of the octagonal turrets to strengthen the angles and to act as buttresses or stops to the ranges of windows. It makes an effective house-front, though we fear it might present difficulties in regard to legal questions of projection beyond the authorised line of frontage of a street.

TRADE CATALOGUES, &c.

MESSRS. BOOTE & Co. send us a new and excellently got-up catalogue of their ornamental tiles for walls, floors, and hearths, printed in colour. The firm appear to make a special feature of the employment of mottled tiles of broken colour in many of their simpler patterns, and these seem likely, as far as one can judge from small-scale illustrations, to give a good and rich surface effect. The more decorative designs, many of which seem very good in colour harmony and form very pretty flower paintings on tiles, are nevertheless not what we call tile design in the true sense. Realistic flower painting on tile panels no doubt comes in well at times, and is popular with the public, but it is not decorative design from an architect's point of view. Messrs. Boote appear to have a fine range of colour and texture available in their materials; they should

procure some designs from time to time from some of the first architectural or decorative designers of the day; they would probably find their account in it in the long run.—Messrs. John Bolding & Sons' catalogue "No. 5," includes prices and engravings of an immense variety of sanitary articles—closet-fittings, sinks, lavatories, baths, pumps, valves, boilers, &c. As in many other cases, the furniture articles in which cast-iron is employed, such as lavatory-stands, &c., would be much better for being simpler and with less attempt at being what is called "ornamental." In a practical sense the articles described and figured seem excellent. There are some special forms of housemaids' sink which deserve attention, and also of closets, especially the "Laydas" syphon-action closet, which in every respect seems excellent, although we doubt if it is advisable to advertise that it "requires two gallons of water only." If the closet does not require more than that, the drain does.

CROSS IN CEMETERY OF TEAMPULL BRECAN, ARANMORE.

THE illustration of this cross is from an engraving in the published report of the meeting of the Royal Society of Antiquaries of Ireland at Galway in July, in the course of which a number



Cross in Cemetery of Teampull Brecan, Aranmore.

of excursions were made to various places of interest in that part of Ireland, including Inmurray and the islands of Aran. Teampull or Temple Brecan is in the north island of Aran. The shaft of one and the fragments of two other crosses, of which this is one, remained in the cemetery. Apparently the fragments had been collected and set in position for the purpose of the illustration.

ST. MARY'S CHURCH, DEVONPORT.—This church, after extensive renovation, was reopened on Sunday last, the 15th inst. The whole of the upper part of the spire, which for years was in a dangerous condition, has been taken down and rebuilt. Mr. H. G. Luff was the Fowrey architect, and the contract was let to Mr. C. Gould, a London steeplejack and builder.

* Dublin: Hodges, Figgis & Co., London and Edinburgh: Williams & Norgate.

Correspondence.

To the Editor of THE BUILDER.

IRON AND CONCRETE FLOORS.

SIR,—Referring to your article last week in reference to concrete construction in America, and more particularly in reference to concrete and iron beams, I should like to point out that Mr. Ransome's American 1884 patent simply describes and claims the combination of twisted iron rods and concrete, and does not state the sizes of rods necessary or show that the size of rod makes any difference whatever to the hold of the concrete on the iron. Now it was shown by my experiments, reported in your issue of May 2, 1891, that round unstraightened rods, just as received from the rolls, and of $\frac{1}{4}$ in. diameter per foot of span, could be securely held by the concrete, and it is very doubtful to me if the hold of a twisted square rod is at all superior to this. It was the non-discovery of the increased hold to be obtained by using small rods that nullified Mr. Thaddeus Hyatt's experiments in 1877, and it was probably not until after the publication of my experiments, and calculations that Mr. Ransome was able to design his beams with any degree of certainty. Certainly, the general circular now issued by his firm bears evidence that they have studied my specifications that showed the advisability of corrugating the ends of the rods as is done in all of my beams as now manufactured. Mr. Ransome has not patented his invention in this country, and I should certainly consider the use of twisted square rods to form concrete and iron beams an infringement of my patents, as it would be for the purpose of using the twisted rods in exactly the same way, and of the same sizes as round ones. Although twisting improves iron, it would probably injure the steel that is used in my beams. FRED. G. EDWARDS.

THE LONDON BUILDING TRADES FEDERATION.

SIR,—The following paragraph was published in the *Daily Chronicle* of September 14, under the heading of "The Labour Movement":—

"The London Building Trades Federation has taken further action against the firm of Messrs. Smith & Sons, builders, of West Norwood, and yesterday at noon between fifty and sixty men, employed on works in progress at Upper Russell-street, Market-street, and Western-street, Horselydown, were called out. This action has been taken in order to compel the firm in question to conform to the terms of the agreement entered into in 1892."

This paragraph contains matter that is foreign to fact. The Building Trades Federation say that the action was taken to enforce the 1892 agreement. We have been no party to this agreement, or been consulted in the matter of extended radius, our works being beyond ten miles from London; and our firm belongs to the Croydon District Builders' Federation, in common with the trade of the district.

We are paying, and have always paid, union rates of wages as applies to the old ten miles radius.

Is the *Daily Chronicle* aware that the agreement of 1892 has fallen through?

We strongly object to the arbitrary and unwarrantable interference of the Building Trades Federation, and are pleased to state that notwithstanding their action the works named are proceeding satisfactorily. JAMES SMITH & SONS.

S. Norwood, S.E.

INSTITUTION FOR BUILDERS' CLERKS.

SIR,—Why has not there yet been formed an institution on behalf of builders' clerks? The builders' foremen have an institution, clerks of works have an institution, then why not a builders' clerks' institution? I am quite sure that an institution formed on a good and solid basis would be of the greatest benefit to master builders as well as clerks, as none but *bona fide* builders' clerks should be allowed to join, and then those of good character and business abilities, so that instidiers should not be pestered with persons not competent for their work.

I should be most pleased to join some energetic men who would do their utmost to promote such a Society for their own and fellow-clerks' good. Of course there would be a host of difficulties to contend with, but that, I think, should promote greater energy to make such a society a success, as I believe that one properly "floated," it would soon enroll some thousands of members from London and the country. "A BUILDER'S CLERK."

P.S.—I have enclosed my name and address, and should be pleased to receive through you any communications on this subject.

The Student's Column.

METALS USED IN BUILDING.—XII.

HAVING described various ores of practically all the metals used in the building trades, and given some account of their modes of occurrence in Nature, we shall now treat more particularly of their alloys. As these latter are manufactured from a knowledge of certain physical attributes of the former under the influence of heat and other conditions, it will be useful, before commencing a systematic review of alloys, to state these physical properties, otherwise the student will hardly be able to grasp the effects of their combination.

ALLOYS.—GENERAL CONSIDERATIONS.

If all metals sold in the market and used in the preparation of alloys were pure, the metallurgist would find many of his most vexing problems easy to solve. But very few metals are unalloyed in Nature, and the market denomination in several important instances merely has reference to the predominating constituent. To reduce metals from their ores in a perfectly pure state is an operation that can often be carried out on the small scale in the laboratory, and in specific instances also, on the large scale—within limits. Speaking generally, however, such a standard of purity cannot be economically arrived at, and if it could, it is doubtful whether any really useful ends would be gained beyond simplifying the education of the metallurgist. When we speak of "lead," or instance, we include in that term, not only the element of that name, but various others, such as silver, iron, gold, sulphur, &c., all of which occur in small proportions in the lead of commerce. Chemically these are, of course, regarded as impurities, but from the practical point of view, are of spoken of as such, unless present in considerable quantity. Just how much of another substance may be permitted to enter into the composition of a metal without being classified as an impurity in the commercial sense, depends almost entirely on the particular uses to which the metal is to be put, and as to how far the impurity impairs its general chemical and metallurgical behaviour.

The same remarks apply in a restricted sense to what are termed the several "qualities" of a metal. A substance that could not under any circumstances be allowed to exist in a bar, or pig, of one kind of metal, may be very desirable in another kind. Using lead, again, as an illustration, we may say that the amount of silver actually present in the ore when extracted, renders the former purer (to a certain extent) in the chemist's eyes, but when taken away it does not improve the appearance of the substance, for instead of being a bright metal it then assumes a dull leaden-grey colour. The builder, however, need not flatter himself that he ever sees lead or any other valuable metal used on the large scale for building purposes in a high degree of purity. In ordinary operations, iron pyrites, so commonly associated with ores of lead, are suffered to remain in the pig, and are worked up with the rest in manufacturing. To be sure, the pyrites are attempted to be removed in dressing the ore, and some machines do the work remarkably well, so that there is nothing to complain of; but in the majority of cases the removal is only effected in a perfunctory manner, and the surface of the pig shows multitudes of minute fragments of that mineral, sometimes visible to the naked eye, but more frequently by the aid of a lens.

The lead buyer understands these things perfectly well, and buys accordingly. An impurity would never do for many special purposes, but it may not matter in the least for others, prominent amongst which are numerous applications of the metal in the building trades. The student of architecture, however, could make himself acquainted with divers qualities of lead used, if only to control the price of articles made of them. Again, the presence of some of these impurities seriously impairs the durability of the metal; they affect ductility, tenacity, and strength. When used in roofing, lining troughs, and the like, its tendency to "buckle" or otherwise must be kept in view; and the "flow" of the metal under stress, as when used on treads of steps, must be taken into its relative purity. But this is not the place to refer to specific uses of the metal, and we have said enough in illustration of our meaning. Several metals are of value on account of their non-tarnishing properties. Some of these very contain a fair proportion of impurity with such properties being seriously interfered with, whilst others become affected in time. Of these, a great deal depends also on the form of

the impurity, and its method of association with the metal. If the impurity were as untarnishable as the substance containing it, no harm might result, but such a case is of very uncommon occurrence. In general, most impurities would promote the action of oxygen, and lead to the surface being slightly tarnished, though only to the stage that would be called "dull"—unless the metal were absolutely worthless, a circumstance that would soon become manifested after the ornament, or fitting, had been fixed up.

So far, we have alluded merely to natural alloys the close alliance of the component parts of which are further strengthened in the majority of instances when their ores are being prepared for the market, unless some constituents are eliminated during the operation. We have no intention of describing metallurgical processes in detail, but as occasion arises they will be briefly alluded to. We may only say now that the particular kind of ore treated of at one mine, or at a series of mines in a locality yielding similar raw material, often leads to a specific variety of the metal which can for commercial purposes be differentiated from the ores of other localities. In course of time the behaviour of these different ores of the same metal become known to the practical metallurgist, and he is made familiar with their effects in combination with other substances, by experience. Further, the particular method adopted in reducing ores of the same character is a prime factor in the ultimate result obtained. Very pure metals are made by electrolysis, and for electrical and other special purposes, great care is exercised in their preparation. In the manufacture of steel the behaviour of all substances employed must be accurately known, so that one kind of steel suitable, say, for "cutting instruments" may be obtained where necessary, in contradistinction to another kind desired for girder purposes. There is very little, if any, guesswork in the preparation of such metals in high-class establishments. It is otherwise, however, in many foundries from which a large proportion of the metals other than iron and steel used in building comes. Those who direct these latter establishments often aim only at the production of a metal of tolerably homogeneous appearance that will pass muster on a general inspection. If the metal produced outwardly resembles another of a more costly nature we hardly like to say what might not be done with it. The multitude of so-called brass fittings used by the builder often reflect the impudence of the manufacturer who has foisted them upon the market—otherwise there is nothing brazen about them, save for the lacquer that does duty for the real article. There is little fear of lead-poisoning from certain "lead" pipes; and our forefathers would blush were they to see some of the miserable stuff that is called copper.

These materials are "alloyed" with a vengeance. There are thriving, in the neighbourhood of Birmingham and elsewhere, several foundries who make small builders' (and other) castings from all sorts of rubbish known generically as "old metal." The student will be interested in their productions, which, we are sorry to say, are largely on the increase. No one thinks to order these fittings to be of a certain composition or strength, and the result in such hands may be better imagined than described. This "old metal" is made of practically anything,—filings, dust, shearings, parings, odd scrap, scalings, &c.—from all sorts of metals and alloys. Providing it will melt down and yield a fairly good casting, without many blow-holes being present, it is brought into requisition. The better kinds are derived from periodical sales of scrap and rough metal found in the Government dock-yards, and from the breaking-up of old vessels. Many of the founders using this class of metal possess no knowledge of metallurgy worth mentioning, and have to make experiments by rule-of-thumb in small crucibles to obtain any desired effect. Nobody frequently obtained in this elementary manner. Sometimes these men are utterly at a loss to know how to get rid of their curious purchases. Instead of yielding the class of metal anticipated, the effect is perhaps an extremely brittle substance of no use to anyone. This has to remain on the premises, to be "worked off" as opportunity offers. At other times old metal is bought, on the understanding that it is of a certain character, though such a warranty naturally enhances the price. The class of founder alluded to will rarely contract to deliver castings of a definite strength; two things guide him, principally, viz., the colour of the metal produced, and its freedom from obvious flaws. Add to this another property—its readiness to take a "dip." Colour, strength,

hardness—everything, has frequently to yield to that. The founder in this case may produce practically anything, and it will find a market if it can only be cleanly turned and finished, and presents a suitable surface to take a metal dip. The latter must be taken on evenly and homogeneously, otherwise the casting is of no use. It is right that the student should be made aware of the existence of these sham materials. As a rule they are brittle and worthless; they will not stand much wear and tear, but are often sold at the same price as the better class of goods they are spurious imitations of.

We do not imply, of course, that all buyers of old metal, manufacture "alloys" of the kinds just described. On the contrary, certain old metals are often superior to modern ones of similar description, and are brought into the highest uses, and rightly so. But the purchasers understand them, and use them accordingly. They bear a correct designation in the market, and there is nothing underhand in their production. We said just now that the low-class mixed-metal founder does not, as a rule, understand much of metallurgy. Some, however, are possessed of sufficient knowledge to add specific metals to "improve the pot," and are aware of the general conditions which lead to the strengthening of the whole. If the resulting cast is brittle they, at any rate, stand a chance of being able to improve upon it within certain limits. As an accident, a few of these compounds have turned out to be truly valuable alloys, and, their real nature having been properly investigated, they take their stand as such.

It is with feelings of relief that we turn from the consideration of alloys produced by a species of jugglery to those of a definite character, resulting from a more or less intimate knowledge of the laws which regulate the union of metals. The subject is by no means perfectly understood, but a great mass of useful information is available to those who care to search for it. Metals are rarely used in their free state; when in that condition they are often too soft to successfully resist wear and tear, and their general range of practical utility is enormously widened by the addition of other substances which may improve or otherwise modify their physical properties. Moreover, the cost of the more valuable metals is lowered by judicious admixture. Silver is both hardened and improved for use by a slight addition of copper, and so is gold. Brittle metals may be rendered tough, highly ductile ones may have their properties in this respect curbed, casting attributes may be vastly improved, and so on, by being properly united with other metals.

It is a doubtful point as to whether alloys are true chemical compounds or not; if some of them are not, then the difference must be of an extremely subtle character. Certain it is that definite compounds do exist in definite proportions by weight in the natural as well as the artificial state. It may be admitted that the majority of metals are capable, to a certain extent, of existing in a state of chemical combination with one another, but that the union is a very feeble one. Several metals only remain in union within certain ranges of temperature. In 1863 Matthiessen showed the probability that the condition of an alloy of two metals in the liquid state might be either that of—(1) a solution of one metal in another; (2) chemical combination; (3) mechanical mixture; or (4) a solution or mixture of two or all of the above; and that similar differences may obtain as to its condition in the solid state. However that may be, it is quite clear that several alloys have at least one constituent partly, if not wholly, existing in the mechanical state, for it may be seen with a lens; and it is equally certain that, in effect, the constituents of other alloys appear to be chemically combined. Practically, the whole subject of alloys rests on an appreciation of the state in which the component parts of the mixtures exist; on that, strength, hardness, malleability, ductility, and nearly all the prime physical properties of the metals must largely hinge. The microscope is now being vigorously applied to throw light on this crucial point, and, so far, the results are very encouraging.

GENERAL BUILDING NEWS.

NEW CENTRAL POLICE OFFICE, ABERDEEN.—These buildings, which occupy the site of the former prison in Lodge-walk, are now finished. The front building is a two-story one of Aberdeen granite in hammer-blocked ashlar work with close-picked dressings. The frontage to Lodge-walk measures 155 ft., and the height of the building is 50 ft. There are three entrances, the main doorway being in the centre. The ground-floor accommodation includes

record-room, property-room, telephone-room, lieutenants' room, waiting-room, charge-room, two detectives' rooms, and inspectors' room. There is also a muster-room, measuring 38 ft. by 33 ft. On the first floor are magistrates' room, chief constable's room, clerk's room, agents' room, surgeon's room, &c. The police and burgh court-room is also on this floor; it measures 35 ft. by 28 ft., and is 20 ft. in height, with panelled ceiling. There is a large projecting cornice supported by enriched truss blocks. At the back of the magistrates' bench are carved pillars, framed panels, and canopy in wood-work, with a heral coat-of-arms on the top, supported on carved trusses. There is ornamental and obscured glass in the windows having the city arms embossed, and there are numerous electric lights in the court-room. For the use of the constables there have been provided, in a south wing behind, a reading-room and library, and also a gymnasium hall, 33 ft. by 32 ft., having gallery at one end, with dressing-room and bath-room over reading-room. The north wing at the back is a two-story cell block, with separate accommodation for males and females. There are thirty-six cells, each 10 ft. long by 6½ ft. wide, built with enamel brick to a height of 5 ft., the upper portion being finished with Keene's cement all round. A detached building contains mortuary and dissecting-room, stable and coachhouse. The main building is connected with the municipal buildings by an overhead gangway. The whole buildings are finished in pitch pine varnished, and lighted by electricity. There is a complete system of telephone communication, and the rooms and lobbies are covered with cork carpet. The plans were prepared by Mr. John Rust, jun., city architect, Aberdeen, for whom Mr. Napier acted as inspector of works. The contractors were:—Mason work, G. Duguid; carpenter work, Hendry & Keith; plaster work, J. Bannochie & Sons; plumber work, Thom & Strachan; painter and glazier work, Masson & Son; heating and electric lighting, Shirras, Laing & Co.; slater work, Mr. Morren; grates, &c., Florence & Son; cabinet fittings, Ogilvie & Sons; all of Aberdeen. The original building contracts accepted amounted to £2,700.

OLD MARKET CROSS, PEBBLES.—After various vicissitudes this old cross, or rather what remains of it, has been re-erected on the site it originally occupied at the head of the Northgate, Peebles. When first built the cross consisted of an octagonal shaft of stone, surmounted by a sun-dial having four faces, bearing at the corners the date 1699. In the year 1807 this was taken down on account of its ruinous condition, but the shaft was subsequently preserved in private grounds at Kingsmeadows. In 1858 it was erected in the quadrangle of the Chambers' Institution in the town, again pulled down, and has just been restored to its former position. As now built the remains of the cross stand on a pedestal 9½ feet in height, which pedestal has four ornamental panels, bearing coats of arms, with a fluted frieze and moulded cornice. An old record states that the shaft of the cross was in existence prior to the year 1320.

BIRMINGHAM.—Messrs. Barrow have in course of erection new premises, consisting of stabling, van-houses, covered-yards, dwelling-house, &c., situated in Dalton-street, on the Birmingham Improvement Scheme area. The dwelling-house will face the street, and will have red brick facing and terra-cotta ornament. The total cost of erection will be about £2,500. The architect is Mr. J. S. Davis, and the contractor Mr. Thomas Rowbotham, both of Birmingham.

EDINBURGH BUILDING TRADE.—At the Dean of Guild Court, on the 12th inst., there were twenty-seven applications and certificates to erect new buildings and to make alterations on existing buildings. Thirteen were granted. The warrants for the erection of new buildings included—To the Governors of George Watson's Hospital for a pavilion at Colinton-road; to Mr. P. Mackenzie for a self-contained dwelling-house at Blackford-avenue; to James Turner for two four-story tenements at Wardlaw-place; to St. Cuthbert's Co-operative Association for a tenement in George-road; to Free Church Temperance Society Trustees for new buildings at 7, 8, and 9, North Bank-street.

TECHNICAL SCHOOL BUILDINGS, STAMFORD.—The new Technical School, erected in Broad-street, Stamford, was opened last week by Sir John Thorold, Chairman of the Kesteven Technical Instruction Committee. The building is a stone structure, erected by Mr. John Woolston, contractor, Stamford, from plans by Mr. C. Traylen, of the same town. When finished, it is estimated that the total cost will be £1,500. The money has been jointly contributed by the Stamford Town Council and the County Council for the parts of Kesteven; the site was given by the Corporation of Stamford.

ST. GEORGE'S (NEW) COLLEGE, WIMBLEDON.—This building, opened a few days ago, is designed as a large private school. It is in the Gothic style, the elevations being mainly constructed of red brick and Portland stone. Independently of a suite of class-rooms sufficient to accommodate 250 boys, provision has been made for about fifty resident pupils. That portion of the building facing Worcester-road has been set apart for the headmaster's private use, and consists of drawing and

dining rooms, study, and extensive offices, together with fourteen bedrooms.

The building is a large hall, 30 ft. high, capable of seating 300 to 400 people, and radiating from this hall are the numerous class-rooms mentioned above. On the first floor above the class-rooms, which is approached by two stairways, there are five dormitories, each with an average floor-space of about 400 ft.; on this floor is also lavatory accommodation for forty or fifty boys. Iron has been used between all the dormitories and passages in lieu of lath and plaster, as a safeguard against fire. At the rear of the building a practical workshop, fitted with carpenter's bench, lathe, &c., together with an excellent laboratory, has been provided. The heating and sanitary arrangements have been carried out by Messrs. T. Potter & Sons, of Oxford-street. The architect is Mr. Latham Withall, of Old Jewry, and the contractors Messrs. Truman Stevens, of South Molton-street, W.

ROMAN CATHOLIC SCHOOLS, HARRGATE.—The memorial stone of the new Roman Catholic schools in connexion with St. Robert's Church, Harrogate, was laid on Tuesday the 17th inst. The edifice will be built of red brick with stone dressings, similar to the church, and is planned to accommodate 318 children. The buildings, which are from the designs of Mr. E. Goldie, of London, are estimated to cost about £3,000.

CARDIFF EXHIBITION BUILDINGS.—At a meeting of the executive council of the Cardiff Fine Art, Industrial, and Maritime Exhibition, held on Monday last, the 16th inst., in the Town Hall, a provisional contract with Mr. Gibson for the erection of the exhibition buildings for 7,774 sq. was confirmed. The buildings have to be finished within four months from the date of commencement.

ST. GEORGE'S CHURCH, CWMPARC, RHONDDA VALLEY.—The memorial-stone of this new church was laid on the 17th inst., the service being conducted by the Bishop of Landaff. The cost of the edifice, which is estimated at 4,000, it being defrayed by Mrs. Llewellyn, of Baglan, near Neath, who three years ago built, at her own expense, St. Peter's Church at Pentre, Rhondda, the edifice and the organ costing 25,000. Two other large churches are being built at her expense in the Welsh coal-mining districts at the present time.

IMPROVEMENTS AT CARLISLE.—The *Local Magazine* states that the Town Council of Carlisle has, after brief discussion, decided to apply to the Local Government Board for a provisional order to acquire under the Lands Clauses Act, a large quantity of land and cottage property in Bridge-street, Caldergate, for the purpose of improving the entrance to the city from the west. The cost of the scheme was estimated at £2,000, but it is believed that the scheme will ultimately reach 20,000. This scheme will complete the series which have been devised for improving the approaches to the ancient city. At present the Corporation is busy opening out Lowther-street and providing a new entrance to the city from the north, which will be a great improvement upon the old approach by Rickenbacker Brow, and one that scheme they are spending upwards of 15,000. There is a fine entrance to the city from the east by Warwick-road, and the entrance from the south, with the court-houses suggesting to some extent the old citadel, is familiar to everybody who has visited the city. The Corporation has been some time at work in the reconstruction of the city, and the market, and they of its reconstruction is a determination in the course of a couple of years to take down an old row of houses and shops in the Market-place called Glovers'-row. This improvement has been discussed for half a century.

BAPTIST CHAPEL, PENARTH, GLAM.—Last week the foundation-stone of the Baptist chapel being built in Stanwell-road, Penarth, was laid. It will accommodate nearly 600 persons, and the front is to be of Newbridge cuttings, with Bath stone dressings, and the sides of local stone. The interior ends will be circular, with a gallery at one extremity, whilst a corridor will connect the present structure with the school-room near by. The edifice is estimated to cost 3,080l.; the architects are Messrs. Jones, Richards, & Budgen, of Cardiff, and the contractor Mr. Thos. Bevan.

POST OFFICE BUILDINGS, WOLVERHAMPTON.—The new post-office buildings at Wolverhampton, which are estimated to cost 12,000l., are being rapidly proceeded with. The *Wolverhampton Chronicle* understands that the general style is French Renaissance, and that the area covered by the building will be 1,704 yards. The frontage to Lichfield-street will present the most imposing elevation. The largest rooms in the building will be the public office and the sorting-room, which are both on the ground floor. The former is 51 ft. long by 30 ft. 6 in. wide; it will have counters on two sides. Leading out of the public office is a long end is a telephone-room, 12 ft. 10 in. by 8 ft., the postmaster's room, strong-room, and chief clerk's office. At the west end, the sorting-office, which is 85 ft. by 36 ft., is situated. Since the original plans were decided upon an addition to this office of 38 ft. by 25 ft. has been directed, and the room is now shaped like the letter L. Immediate adjoining it is to be a landing platform for the mail-carts. On another side are the delivery-room, 28 ft. by 20 ft., boys' kitchen, 23 ft. 6 in. by 20 ft.; postmen's kitchen, 24 ft. by 16 ft., &c. In the yard is a

shed for the trucks used for parcels' post work. On the first floor, in the centre over the public office, is the instrument-room, practically the same size as the office just named. The floors throughout will be of Portland cement concrete, the public office and main entrances being paved with York flags, the offices with wood blocks, and the yard and areas with Stuart's granolithic paving. The roof principals are constructed of steel, and these, with the remainder of the girders and steel joists used, are supplied by Messrs. E. C. & J. Keay, of James Bridge. The public office, sorting-office, and the instrument-room will be heated by low-pressure hot-water system, and the offices by Galton's ventilating grates. The building will be faced with Partridge's red-pressed facing bricks from Kingswinford, and the terra-cotta dressings, &c., come from the works of Mr. Dennis, Ruabon. The roof will be covered with Tiberthwaite green slates. The architect is Mr. Henry Tanner, of Her Majesty's Office of Works, London, and the builder Mr. Henry Lovatt, of Wolverhampton.

OPENING OF THE BURT HALL, NEWCASTLE-ON-TYNE.—The large edifice to be known as the Burt Hall (after Mr. Thomas Burt, M.P.), Newcastle, was opened on Saturday last, the 14th inst. It is to be the home of the Northumberland Miners' Mutual Confidence Association, and stands in close proximity to the Medical College. The *Newcastle Daily Chronicle*, in describing the building, states that it is on two floors, and occupies an area of 77,535 sq. ft. Externally, the walls are faced with red Leathershire bricks, with stone dressings from Brunton and Dunhouse quarries, and part dressings of terra-cotta; the roof is covered with green Westmorland slates. The Northumberland-road front has an oriel window, entirely of stone, and is completed by a gable, on the summit of which stands an expression of a miner, from Mr. Ralph Hedley's picture, "Going Home." In the centre of the gable is the Northumberland County arms, and on each side of the oriel are niches. A wide corridor runs the length of the main building, and off this are the waiting-room, offices for president, secretary, and treasurer, stores, &c. The staircase to the upper floor is entirely of oak. On this floor, the hall for the meetings of the delegates, is 100 ft. long, 48 ft. by 26 ft., and lofty. The oriel window has six panels, with medallions bearing symbolic designs. On this floor there are also a committee room and a large room to be used as a library. The remainder of the buildings comprise residences for the secretary and treasurer, the general heating is by steam; in addition, there are fire-places to heat the rooms, but not in the hall. The general contractor is Mr. S. B. Burton; the plumber is by Mr. Stephen Percy; the slating by Mr. John Hewitson; the plastering throughout is in adamant the window casements and heating apparatus by Messrs. Ashwell & Nesbit; the painting by Mr. John Gibson; the terra-cotta, fence, and sanitary fittings by Messrs. Doulton & Co.; the electric lighting by Messrs. R. J. Charleton & Co.; the lead glazing by Mr. J. G. Baguley; and the special fitting and furnishings by Messrs. Robson & Sons. The whole of the works have been designed by Mr. John W. Dyson, architect, of Newcastle; Mr. Coupland W. Flynn, of Gateshead, has acted as the clerk of works.

MUNICIPAL TECHNICAL SCHOOL, BIRMINGHAM.—This building, which is now approaching completion, will be opened very shortly; that portion to accommodate students for the winter session commencing at the end of September, will be ready in a few days. It will probably be one of the largest and best equipped technical schools in the country. The *Birmingham Daily Gazette* states that the building occupies an area of 3,000 yards, and is built in the English Renaissance style, with bold gables and mullioned windows. Red brickwork and buff terra-cotta have been used in the construction. In the basement are the engine-room, in which are placed three large and powerful engines for generating electricity for lighting and motive power; there also is the laundry and steam ironing shop, the heating apparatus, &c. The iron and steel shop, which is near the engine-room, is a large compartment fitted with furnaces, muffles, and a the necessities for full instruction in these branches of manufacture. The pattern shop is in a detached building. In a main corridor are the brass and metal shops, which have a frontage of 120 ft. The chemistry laboratory contains testing machines and other mechanical appliances, and adjoining it are the lecture and preparation rooms. The front portion of the building is the laboratory for electro-metallurgy and brazing, the practice lecture-room, preparation, battery, and drain rooms, and on the east wing are the brass and metal shop and a suite of rooms connected with the metal shop and department. Many others are devoted to physics and chemistry and applied physics, and there are apartments for the professors of the various sciences. The second floor is devoted to class-rooms for the women's department and large rooms for the teaching of geometry. The back wing contains a series of rooms to be used in connexion with the chemistry department. In all, the rooms for the teaching of the many subjects number 116. On the left of the main entrance are the administrative rooms which consist of secretary's office, clerk's room, the principal's and committee rooms; and the apparatus

ents above are reached by a wide staircase. Much are has been devoted to the decoration of the large examination and assembly room on the ground floor. A high dado of glazed bricks of grey tints runs round the walls, and are ornamented above by works in terra-cotta of a better quality than that used in other parts of the building. The front of the school facing Suffolk-street is largely constructed of terra-cotta, with panels of the same material having figures and groups emblematical of science and industry, and over the central doorway the arms of Birmingham stand in bold relief. A large balcony ornamented with huge griffins, runs round the front and sides of the building, to be used by students, in case of an outbreak of fire. The cost of erecting and fitting up the whole building is estimated at £3,558. The work was commenced in October, 1893, from the plans of Messrs. Essex, Nicol, & Woodman, and Messrs. Sapcote & Sons are the builders.

INFECTIOUS HOSPITAL, PAIGNTON.—Designs for an infectious diseases hospital have been prepared by Mr. J. Stanfield Brun, surveyor to the Urban Sanitary District Council, and submitted to the Local Government Board, who have requested the Council to send a deputation, with its surveyor, and the medical officer of health, to London, to confer with the Local Government Board on the subject.

ANITARY AND ENGINEERING NEWS.

NEW BRIDGE OVER THE ABERDEENSHIRE DEE.—There has just been opened for public traffic Marylester Bridge at Milltimber, about seven miles from Aberdeen. It is a steel girder bridge, of three spans, with two masonry side arches, and two viaducts in the river, built of masonry. In all there is a clear waterway of 232 ft. and the roadway is 10 ft. wide. The bridge has been constructed for a uniformly distributed live load of 112 lbs. per square ft. and for the heaviest traction engine traffic. The roadway is paved with small granite flags. The bridge was designed by Mr. James Barron, C.E., Aberdeen, and the cost, including approaches, has been £5,600.

NORTHAM (DEVON) WATER SUPPLY SCHEME.—The Northam District Council was occupied on Saturday last, the 14th inst., in considering a scheme for a water-supply to the district, presented by Mr. Edwin Latham, C.E. The engineer remarked that the population of the parish in 1891 was about 1,000, and that it was increasing it would be necessary to get a supply sufficient for future needs. The elevation of the district was very variable. There would be no difficulty in supplying Westward Ho! and Appledore by direct gravitation, but it would be difficult to get a water-supply sufficient to reach the higher parts of Northam by gravitation. The strata appeared to be of Carboniferous age, and very much disturbed. He had marked five sites as collecting areas, but one at the north of Ridford Farm, Abbotsham, would be most suitable. It had a collecting area of 120 acres, and there was no habitation within this ground. One great advantage was that there were no mill rights. A proposed pond for impounding reservoir on the south side of the collecting area. This would be sufficiently high to supply Orchard Hill, part of Northam, the whole of Appledore, and the whole of Westward Ho! by gravitation. In order to make economical waterworks it would be necessary to get intermediate distributing reservoir at a point along a pipe-track at the 200 ft. contour. This would be enlarged. The town of Appledore would be economical. At this point they could have small pumping plant to send water to a high-level reservoir, to supply the more elevated parts. After prolonged discussion it was resolved that Mr. Latham should supply plans and estimates for the scheme.

ELECTRIC LIGHT INSTALLATION, AYR.—The works which are to supply the town of Ayr with electric light are almost completed. The *Scottish Engineer* states that the generating plant is built in a large central station on the south bank of the river running through the place, and the buildings include power-house, boiler-house, and offices. The principal feature is the power-house for generating the electricity by machinery, which is a spacious building and well lighted. The power is supplied by two boilers, working at a pressure of 5 lbs. when condensing and 140 lbs. when non-condensing, fitted with mechanical stokers, each capable of supplying 200 horse-power. The high-tension alternating system has been adopted. The current, there are four sets of 110 volts in the power-house, the two principal circuits each driving a 100 kilowatt alternator, by Messrs. Co., of Woolwich, which gives 50 amperes, 2,000 volts at terminals. The principal machines are capable of supplying light to the amount of 6,600 ft-candle lamps, and a 50 horse-power machine for eight-candle lamps. The total amount of light generated is thus nearly 100,000 ft-candles. It is contemplated that the plant may also be used to work a railway between Burns Monument and Prestwick, though Ayr, a distance of about six miles.

WATER-SUPPLY WORKS, LEICESTER.—The new water-works at Swithland being constructed in the north at the foot of Buddon Wood are now well in progress. The first sod was turned about four months

since, and the other day the members of the Water Committee of the Leicester Corporation paid a visit to the site to inspect and report on the progress made. They found that two-thirds of the work had been accomplished, and hope the formal inauguration may take place next July. When the reservoir, which will cover 200 acres, is complete, Leicester will be in possession of three sites for water storage, viz. Thornton, Cropton, and Swithland, equal to a total storage of 1,400,000,000 gallons, sufficient for a population of 300,000. The new works are being carried out by Messrs. J. Aird & Sons, from the designs of Mr. J. B. Eversard, C.E.

STAINED GLASS AND DECORATION.

ST. MARY, CRUMPSALL.—A two-light window in this church has been fitted with very elaborate painted glass. One light contains a figure of Isaiah and a panel beneath, "The Vision of His Prophecy," "Behold, a Virgin shall conceive and bear a Son." In the other light is depicted Daniel, and below, the subject of his interpretation of Belshazzar's dream. This window is part of a scheme for the windows of the north aisle, to be executed by the same artists, Messrs. Percy Bacon & Bros., of London.

ARDLEIGH, ESSEX.—The decoration of the chancel of this church, commenced last year as a memorial to the late Canon Perry, has just been completed—the artists being Messrs. Percy Bacon & Bros., who worked under the instructions of the architect, Mr. E. Geldart.

FOREIGN AND COLONIAL.

FRANCE.—It is announced that the painter Roybet, and the sculptor Chaplain, have gained the large gold medals at the Exhibition of Fine Arts, at Berlin. MM. Boldini and Alexander Harrison have gained secondary gold medals. The Department of Public Works in Paris is now making a new bridge across the Canal Saint Martin, between the Place de la Bastille and the Pont Mazas. It will be opened for traffic next year. The sculptors, Hugues, Geoffroy Dechaumes, Fagel, and Lefèvre, have been commissioned to execute alto-reliefs representing workings in wood, iron, and stone, electricity and navigation, for the decoration of the facade of the new Marie of Ivry-sur-Seine. M. Lefèvre has also been commissioned to execute a pediment sculpture representing the town of Ivry seated on a symbolical vessel. To-morrow, September 22, the new Cathedral of Gap is to be inaugurated, which was commenced twenty-nine years ago. It is a building in the Romanesque style. A committee has been formed to erect a monument at Barcelles, commemorating the brave defence of that town in 1870. M. Thomson, second Prix de Rome, has been commissioned to execute this monument, which is to be placed at the entrance of the town, opposite the house which Alphonse de Neuville has taken as the subject of his well-known picture, "Les Derniers Cartouches."

It is announced that the Hotel of the Sous-Prefecture of the Châtelet in Paris is to be rebuilt. A quay of 300 metres in length is to be constructed at Bayonne, on the left bank of the Adour. It is for seagoing ships. The expense of the construction is estimated at a million francs. The Government has just offered a sum of 500,000 francs for the rebuilding of the Lunatic Asylum of La Châtre (Nievre), which will be considerably enlarged. The town of Montdidier is to have a competition for the rebuilding of the Hotel de Ville, the expense of which is estimated at 200,000 francs.

The jury of the open competition for the building of a Salle des Fêtes at Cateau (Nord) has awarded the first prize to M. Dehaudt, architect, of Lille. The second prize has been given to M. Chérier, architect, of St. Quentin; and the third prize to M. Dutoquet, architect, of Valenciennes. The International Exhibition of Fine Arts at Cannes will open on October 15, on the Boulevard de la Croisette. We are informed of a new act of vandalism on the part of the Municipal Council of Cambrai, who have decided on demolishing the Porte Notre Dame, a most original triumphal arch of the Renaissance period, with a very rich decoration. The Municipality of Douai, on their part, have voted the destruction of the Tour Saint Eloi, a curious monument of the fourteenth century, because it is not on a line with a new boulevard. The Government will shortly commence the work of enlarging the quays at the Dieppe harbour, the expense of which is estimated at 2,220,000 francs, also the enlarging and lengthening of the jetty north of the Port d'Alger. This latter work will cost about 850,000 francs. The death, at the age of eighty-nine years, of M. Louis Adolphe Salmon is announced. He was a copper-plate engraver, pupil of Ingres and Henriquel-Dupont. M. Salmon had obtained in 1834 the Prix de Rome for engraving. He had received medals at the Salons of 1853, 1857, 1859 and 1863, he had also received the Legion of Honour at the Exhibition of 1867. He was also a very good water colourist. We have also to record the death of M. Jules Ernest Sylvestre, painter and engraver, pupil of MM. Hébert and Luc Olivier Merson, who has just died in the National Asylum at Vincennes.

MISCELLANEOUS.

CHANGE OF ADDRESS.—Messrs. Jones & Attwood, of Stourbridge, announce that they have removed their London offices from 110, Cannon-street to 35, Old Queen-street, Westminster, S.W.

A LONG SERVICE.—Mr. John Spratt, a clerk in the employ of Messrs. William Cubitt & Co., builders, Gray's Inn-road, London, on Thursday last completed fifty years' service with the firm. During the whole time he has been in their employ he has never been absent through illness. As a memento of the occasion, the staff presented him with an address, accompanied by a very handsome clock and bronzes.

CHANGE OF ADDRESS.—Messrs. Messenger & Co., horticultural builders and heating engineers, of Loughborough, inform us that they have this week removed to more spacious business premises recently erected by them near the L. & N.W. railway station in that town. The new buildings occupy an area of about two acres.

A PNEUMATIC FIRE ALARM.—The Franklin Institute has lately awarded a premium and medal to Mr. Albert Goldstein for his pneumatic fire alarm telegraph system, a description and report upon which, by the committee on science and arts, will be found in the *Journal* of that Institution for last month. The device is entirely pneumatic and mechanical, and embodies a magneto-electric machine for the transmission of the telegraphic alarm to the head-quarters of the fire brigade. It consists essentially of three parts, namely, a thermostat, which acts under the influence of a fire near it; an annunciator, which receives the alarm from the detector or thermostat, and indicates it by causing a bell to ring; and a transmitter, which is also actuated by the thermostat, and transmits the alarm by wire to a pre-determined station. The thermostat is composed of a small cylinder, in which is a washer of asbestos coated with paraffin. Beneath this washer a loose-fitting piston is placed, immediately above a spiral spring, held in compression by a rod, the lower end of which is only retained in place by two halves of a disc held together by a solder capable of melting when the surrounding temperature rises above 150 degrees Fahr. When the thermostat is subjected to this temperature, the two halves of this disc part, releasing the rod and the spring, which, by their rapid upward movement, cause the piston to drive the air in the cylinder through a pipe, and thus produce a corresponding impulse upon a small bellows or diaphragm in the receiver, by means of which a bell is set ringing, and at the same time the room where the fire exists is indicated. The system in question, both in its conception and simplicity, shows that much thought has been spent upon it, and in consideration of this, and of the beneficial results demonstrated by numerous practical tests, the Franklin Institute have deemed the inventor deserving of the reward above referred to.

KIRKSTALL ABBEY—A PUBLIC PLAYGROUND FOR LEEDS.—On Saturday last, the 14th inst., Kirkstall Abbey and grounds were dedicated "a playground for ever for the citizens of Leeds." A large portion of the picturesque ivy that once adorned its walls has been torn down under the plea of restoring, or rather repairing, the masonry. New pieces of stone-work have been inserted at odd corners. The result, says the *Newcastle Daily Mercury*, is "not altogether pleasing to the eye, and there are some things, perhaps, which might have been avoided." Of course, "broad gravel walks bordering trim gardens" have been laid out where the artisans and their families who reside in the immediate neighbourhood have great numbers may henceforth take their pleasure.

MEMORIAL TO BISHOP HARVEY GOODWIN, CARLISLE CATHEDRAL.—This memorial, which has been placed in position in one of the bays of Carlisle Cathedral, was unveiled by the Archbishop of York on Tuesday last, the 17th inst. It consists of the bronze statue of the bishop by Mr. Hamo Thornycroft, R.A., exhibited at the Royal Academy this year, placed beneath a carved oak canopy in the Renaissance style, designed by Mr. Waterhouse, R.A. The late prelate is represented as lying in a recumbent position, attired in episcopal robes, with the hands joined above the breast and pointing upwards; the feet resting against a rock, behind which stands the episcopal mitre. Around the head of the figure is a group representing cherubs. In the central panel at the back of the canopy is a suitable inscription, the joint effort of the Master of Trinity and Mr. Ruskin.

EXHIBITION OF PLUMBERS' WORK, DUMFRIES.—The exhibition of plumbers' work in connexion with the Scottish Congress continues to attract attention. On Saturday last, the 14th inst., Sir Stuart Knill, Master of the Plumbers' Company, delivered an address to the younger members of the craft, present, exhorting them to be thorough and earnest in their work. Sir James Crichton Browne hoped that County Councils generally would afford material support to the teaching of plumbing as a branch of technical education.

CAPITAL AND LABOUR.

THE *Labour Gazette* remarks that during the past month the building trades were well employed, and the percentage of unemployed members of

CONTRACTS AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Police Station, Munkich, Fife	Crowe Corporation ..	D. Henry	Sept. 21
Hospital	Hewitt Bros.	G. E. Boulton	Sept. 24
Rebuilding the King's Head Inn, Dou-	Gutley (York) U.D.C.	H. Acheson	do.
glasgow	Southampton Corp.	A. E. Preston	do.
Pipe Sewer (18 in.)	Tottenham U.D.C.	W. B. G. Bennett	do.
Quarrying Granite Road Metal	Lewisham B.D. of Wks.	P. E. Murphy	do.
*Making-up Roads	Bromley U.D.C.	Official	do.
*Road-making Works, Brixton road	J. Potts	do.	do.
*Road-making Works, Judd-road	Oswaldtwistle (Lancs) ..	Willink & Thicknesse ..	Sept. 25
*Surface Drainage Works	U.D.C.	R. N. Hunter	do.
Additional, &c., to Rectory, Worthington, ..	Laurel & York R. Co.	R. S. Platt	do.
Cumberland	Gelcorse and Riggs ..	H. Shierline	do.
Intercepting Sewer, Blackburn-road, &c. ..	R.D.C.	W. Heron	do.
Brick Sewer, Moss-street	Cardiff Corporation ..	W. Harper	do.
Twelve Artisans' Dwellings, Sparrow- ..	Kingston-on-Thames ..	Official	do.
Bollon	C.P.	do.	do.
Wallage and other Works, Fensham, Glam ..	Cheltenham Corp.	do.	do.
Homes, Roller Shed, Offshore, &c. Panny- ..	do.	P. M. Beaumont	Sept. 26
street, Cathays	S. Watkin	do.	do.
*Broken Granite	Longton Corp.	J. W. Wardle	do.
Sewering, Draining, &c. Pipe road	Longton Church ..	Young & Mackenzie ..	Sept. 27
Filter Beds and Storage Works, Bowden ..	Committee	H. Walls & Sons	do.
well	Official	Official	do.
Three Villas, Wellington-road, &c.	Canarywharf S.B. Bd. ..	Official	do.
Four Cottages, Benthick Colliery, Kirby- ..	Lytham (Lancs) U.D.C.	Official	do.
in Ashfield	Llanelli U.D.C.	G. Watkeys	Sept. 28
*Valuing T. W. Hall, &c.	Penzance Club	O. Caldwell	do.
Alterations, &c., to the Lecture Hall, Hill ..	Erithingham D.C.	R. M. Parkinson	do.
street, Lough	West Hartlepool S.B. ..	P. Baker	Sept. 30
Additional, &c., to St. Peter's Schools, ..	Barnegate Corp.	E. P. Blinde	do.
Hindley, Lancs.	Wilton (Wilts) R.D.C.	S. Sloud	do.
School, Penzance	Official	do.	do.
*Laying-down 2 1/2 acre square yards Council ..	District Water Co.	do.	do.
Water-kegs Stone, 100 tons	R.D.C.	do.	do.
Drainage Works, East Ruxton, new ..	Edwin Unwin	do.	do.
Flooding	Latham & Burroughs ..	do.	do.
Club Premises, Alexandra-road	U.D.C.	Wood & Brodie	do.
Drainage Works, East Ruxton, new ..	Official	A. G. Balwell	do.
*Fifty Seats for Cemetery	Official	C. A. Owen	Oct. 2
New School Buildings, &c.	Official	M. Morgan	do.
Payne and Flagging Works, James-street ..	Official	do.	do.
Print Road Metal	Official	do.	do.
Quarrying Granite Road Metal	Official	do.	do.
Road Metal	Official	do.	do.
Reservoir and Main, Wingate, Durham ..	Official	do.	do.
School, Copley Mills, Halifax	Official	do.	do.
Additional, &c., to Asylum, Embsaythorpe ..	Official	do.	do.
School, Copley Mills, Halifax	Official	do.	do.
Glam	Official	do.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Payne Back, Hanningwood-terrace, Bill ..	Felling U.D.C.	H. Miller	Oct. 2
*Alterations at Workhouse	Assenught & Guardians ..	F. W. Aldwinckle	Oct. 8
Nine Houses, Letchford	North Fens Guardians ..	D. E. Thomas	do.
*Sanitary Work at Forest Gate School ..	Forest Gate School ..	G. E. H. Mason	do.
*New Skylights to Market	Aberavenny U.D.C.	Official	do.
*Road-making and Sewer Works	Horsey U.D.C.	Official	do.
*Erection of Sixteen Coast Guard Houses ..	Amur Vitz Wks. Dept.	do.	Oct. 4
Drum Lane, Bu. Jiggs, &c.	Cambridge Corp.	J. T. Wood	Oct. 7
*New sewerage Works	do.	do.	do.
*Waterworks	Kells (Ireland) T.C.	J. H. H. Swiney	do.
*Supply of and Laying Pipes, Valves, ..	Southampton C.P.	W. Matthews	Oct. 10
Hydants, &c.	Walthamstow Sch. Bd.	Official	do.
*Purchase of Meters	Shepherd Union	W. L. Grant	Oct. 9
*New Class-rooms, &c., to School	Leamington Council ..	John Elford	Oct. 10
*Additions to Infirmary, &c.	Pease Town Council ..	do.	Oct. 12
*R. erects in of Wall, &c. Glenside Park ..	Barnet U.D.C.	W. H. Mansbridge	do.
*Quarry W. 11 1/2 feet	do.	E. & P. Stephenson ..	Oct. 15
*Granite Rectory and Chanceling	Landudno U.D.C.	do.	Oct. 17
*Industrial Saw Factory	St. Pauls Guardians ..	A. & C. Harston	do.
*Brick and Pipe Sewers, &c.	Llanabry Asylum ..	do.	Oct. 20
*General Wines	do.	do.	Oct. 21
*Manufacture of Blocks	do.	do.	Oct. 22
Drain Pipes, &c.	do.	do.	Oct. 23
*Completion of Asylum, Colford	do.	do.	Nov. 4
*New School, &c., to School	do.	do.	Nov. 4
*R. erects in of Wall, &c. Glenside Park ..	do.	do.	Nov. 4
*Quarry W. 11 1/2 feet	do.	do.	Nov. 4
*Granite Rectory and Chanceling	do.	do.	Nov. 4
*Industrial Saw Factory	do.	do.	Nov. 4
*Brick and Pipe Sewers, &c.	do.	do.	Nov. 4
*General Wines	do.	do.	Nov. 4
*Manufacture of Blocks	do.	do.	Nov. 4

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be made.
*Clerk of the Works	Wandsworth Vestry ..	21 10s. per week ..	Sept. 22
Clerk of Works, Haslingden	Joint Beverage Com. ..	do.	Sept. 22
Clerk of Works	Stratford-on-Avon ..	do.	Sept. 22
Clerk of the Works	Sittingbourne U.D.C.	do.	Sept. 22
*Assistant Surveyor	Hanley Corporation ..	120s.	Oct. 7

Those marked with an asterisk (*) are advertised in this Number. Contracts, pp. iv., vi., and viii. Public Appointments, pp. xviii. and xx.

unions making returns has fallen from 2'4 in July to 1'8 in August, compared with 3'4 in August, 1894. Five new disputes in the trades occurred last month, but they do not appear to be important. The London bricklayers, carpenters, plumbers, and mill-sawyers, describe employment as good; the plasterers, painters, masons, and stone-carvers as fair. In the Tyne and Wear district, factory-coopers are working short time, with 15 per cent. unemployed. A decline in the building trades is reported from Macclesfield, though on the whole there is nothing to complain of. In Liverpool, painters are slack, but joiners well employed. Most of the quarries in Derbyshire are working short time, and there is no improvement in the stone trade in the area; on the other hand, very few builders are unemployed. The building trade throughout the Potteries, and at Leek, is only moderate, though the brick and the yards are in full work. At Ipswich the stone-masons are slack, and the painters dull, at Colchester the bricklayers report employment as not very brisk, but other branches of the building trades in Suffolk and Essex are good. Plymouth and South-Western district reports the trades as fairly well employed, but quiet at Exeter and Torquay, and in most parts of Cornwall. Set-makers in the Weymouth district have obtained a temporary rise in wages on one class of work; and in Ireland the trade in general is good, building operations being especially brisk at Drogheda and Curragh. The activity of the building trades in Belgium is such that considerable difficulty is experienced in finding enough men to do the work to enable contracts to be completed in time.

BRICKLAYERS' STRIKE, RUGBY.—The *Rugby Advertiser* states that the strike of bricklayers in that town does not appear to have seriously interfered with building operations, which have gone on steadily through the summer. At the present time between twenty and thirty men are engaged in

erecting the first batch of sixty cottages intended to be built in the vicinity of Worcester-street and Newbold-road, and new men are not difficult to get.

MEETINGS.

FRIDAY, SEPTEMBER 20.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castell-Evans, F.I.C., on "Elementary Physics and Chemistry: the Chemistry of Fuel and Combustion." V. 8 p.m.

SATURDAY, SEPTEMBER 21.

Northern Architectural Association.—Visit to Messrs. Swan & Hunter's, Wallsend.
Liverpool Engineering Society.—Excursion to the Wirral Railway Works, Sir D. Fox, Chief Engineer.

TUESDAY, SEPTEMBER 24.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castell-Evans, F.I.C., on "Elementary Physics and Chemistry: Sanitary Chemistry." VI. 8 p.m.

WEDNESDAY, SEPTEMBER 25.

Sanitary Institute.—Inspection and Demonstration in the Parish of St. George's, Hanover-square, by Mr. Albert Taylor. 2 p.m.
Builders' Foremen and Clerks' of Works Association.—Quarterly Meeting of the Directors. 8 p.m.

THURSDAY, SEPTEMBER 26.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Louis Parkes on "Ventilation, Warming, and Lighting." 8 p.m.

SATURDAY, SEPTEMBER 28.

Architectural Association.—Visit to Wickham Hall. Leave Cannon-street Station 2.18 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

15,458.—**WINDOWS:** *R. Frame.*—Relates to windows which are hinged at one side, so as to open inwards for cleaning purposes. The upper sash is provided with hinges, having slots suitably arranged to engage with hook-shaped projections from the bottom-rod and swing freely. The hinge on the lower sash has a loose flap with a projecting stud, which is arranged to enter a keyhole slot formed in a plate secured to the side stile, and the loose flap is by this means turned into a hinged support of which the lower sash is swung open. Other modifications are mentioned, amongst them an angled handle on the sash-fastener for guiding the blinds over the lower sash.

18,693.—**CHIMNEY-POT:** *J. Fielden.*—A chimney-pot constructed with a wider outlet than base, with suitable diagonal openings or louvres.

19,183.—**LATHING:** *E. Stimson.*—Consists of sheets of paper-maché or similar material formed with holes punched round the edges and bevelled, so as to form dove-tailed hold for the plaster.

15,477.—**FIRE-GRATES:** *C. Corbitt.*—A kind of double frame or basket arrangement for placing inside fire-grates as fuel-holders. Consists of two halves which are hinged and rest on suitable supports, the halves being free to move outwards until they come in contact with the front and back of the fireplace.

8,612.—**DOOR-SPRINGS:** *P. Aylon.*—Deals with method of arranging combined door-springs and checks. The check is of the pneumatic order, with the usual piston and cylinder, and the claim relates to the coupling of the out-end of the lever arm and piston-rod end to the door through the medium of a link or pair of links.

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Interior, St. Swithin's Church, Lewisham.—Mr. Ernest Newton, Architect *Double-Page Photo-Litho.*
Modern Scottish Houses, Built in Local Style.—Mr. R. S. Lorimer, A.R.I.B.A., Architect *Two Double-Page Photo-Litho's.*

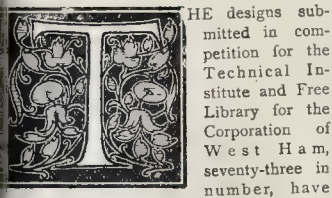
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The West Ham Technical Institute Competition.



HE designs submitted in competition for the Technical Institute and Free Library for the Corporation of West Ham, seventy-three in number, have been on view during the present week at the Public Hall in Barking-road. After the recent discreditable affair of the Durham County Buildings, of which the last has probably not yet been heard, it is an agreeable task to have to record a competition like that of West Ham, which has been admirably conducted throughout, and in which there can be no question that the right design has been selected.

The West Ham building is to be erected on a site in Romford-road known as "The Green," and bounded by Romford-road on the south, Water-lane on the west, and "The Green" on the north; the east side of the site being partially defined by existing buildings. The new building was specified in the instructions to contain the usual departments of a Technical School—shops for engineering and building trades, chemical and physical laboratories, an electrical workshop, an art school, school of cookery, laundry, &c. Added to this a lecture-hall on the ground-floor, to accommodate 500 persons, and two smaller lecture-rooms for 200 persons each (the special object of these smaller lecture-rooms was not defined); administrative offices, lavatories, and other usual adjuncts. The Free Library department was to be capable of being managed and controlled separately from the Technical Institute, and to include a lending library, reading-room, reference library, book store, and librarian's office so placed as to enable the librarian to have easy control of all the departments. The whole of the library department was to be on the ground-floor, except some small rooms for binding-shop, store-rooms, &c. The principal entrance was to be in Romford-road, other entrances to be placed at the discretion of the competitors, and architectural style was to be left entirely to their discretion. The cost of the whole not to exceed 40,000/.

The Technical Institute department was also to include six class-rooms, and two rooms "for social purposes." In the subsidiary instructions, issued to give further information on a good many points on which information had evidently been asked for, it is stated that these two social rooms were to be one for men and another for women; an instruction which certainly ought to have been given in the first-issued paper, as the proper placing of these rooms on the plan would be materially affected by this consideration. Nothing was said in the instructions as to providing a separate entrance for women, but a considerable number of the competitors have assumed that such an entrance would be desirable, and have made separate entrances for men and women a feature in their plans, placing the women's entrance in contiguity to the departments which are generally supposed to be especially women's work, such as the laundry and cookery school. Practically they were probably right in this view; though theoretically it may be supposed (in the present day) that there is no reason why some women might not wish to enter the classes for engineering and building trades, and at all events they would be equally eligible with the other sex for the study of chemistry and for the art department, so it would hardly be possible that the separation of the sexes could be planned for entirely in the building; nor has any competitor, as far as we observed, attempted to do this.

It is evident that the position of the large Lecture Hall, which would be practically a hall for public entertainments for the district, must form one of the most important key-points in the arrangement of the plan; it is the central feature of the Institute portion. The other important point would be the relative positions of the Institute and Library portions of the building, which must form two independent sections. The site is approximately square, and has full access on three sides—north, west, and south; so that it is on the whole a favourable one for planning. The principal front, towards Romford-road, faces a little east of south.*

The plan of Messrs. Gibson & Russell, to whom the first premium has been awarded,

is admirably arranged in almost every respect, and after looking pretty carefully through the whole set, we can see no other which has a claim to compete with it. The main entrance is in the centre of the Romford Road front, and the vestibule leads into a wide corridor running parallel with the front, with columns down the centre of it. Between this and the front wall are various small rooms, including the board-room and secretary's office. The workshop portion of the Institute is ranged on the right off a corridor from front to back of the building, with another entrance from "The Green"; the secretary's office, which seems at first sight a little too far from the central entrance, is however perhaps most properly placed where it is, at the angle of junction of the front and side corridors, so as to be of easy access from both portions of the building. The two principal staircases open from the large corridor parallel with Romford-road, towards either end of it, and are well situated for convenience. At the end of this corridor, from Water-lane, a "women's entrance" is provided, and the rooms chiefly devoted to women's work are grouped near this. The main entrance to the large hall is from Water-lane, the hall forming a large oblong apartment running parallel with Romford-road, and filling up most of the centre of the building. The approaches to the room from Water-lane might be improved; there are rather narrow little corners in the corridors outside the two outer doors into the hall, and the ladies' and gentlemen's cloak-rooms should not be planned with doors exactly facing each other, a mistake constantly made in planning; for the sake of symmetry, we presume. The Library block occupies the north-west portion of the site, and is also entered from Water-lane, lower down. It is very well arranged; the reading-room and reference-library are kept well inside, away from the noise of the street, and the librarian's room is excellently placed for inspection and control of the whole department. These rooms are for the most part top-lighted. The lending library and book-store are placed towards the outside of the building, thus protecting the rooms for study. In connexion with the large lecture-hall is a wide corridor running from the central entrance in Romford-road into one side of the hall, thus forming a most efficient extra exit without any interference with the main

* We observed that scarcely any of the plans show a north and south point; probably the points of the compass were regarded as known, but it is always better to draw the actual north direction on the plan.

lines of the plan. The retiring-rooms in connexion with the platform are conveniently enough arranged in a mezzanine; they are better at the platform level if it can be managed easily, but it is not essential that they should be so.

The Art-School rooms are on the upper floor, partly on the Water-lane, but mostly on the "Green" front, and thereby naturally get a north light; the class-rooms are grouped on the same floor towards Water-lane, and the chemistry and other technical rooms on the east side. The two small lecture-theatres find place on the Romford-street front, back to back, the door of each being near the head of one of the staircases. The only objection to their arrangement is, that the wall dividing them is built over the centre of the ground-floor vestibule, making rather a discrepancy between the ground-floor and first-floor plans at this point, though it is perhaps one more observable on paper than it would be in fact.

It is rather surprising that nothing is said in the instructions about the aspect of any of the rooms, although, of course, aspect is of the highest importance in the drawing and modelling rooms. This is an oversight; for though competitors ought to know that a north light is required for such rooms, it is evident that some of them do not.

Messrs. Gibson & Russell indicate a system of extract ventilation by means of air-trunks, which are led up to two small towers forming external features in the design, the extract being actuated by an electric fan placed in the upcast shafts.

In the architectural treatment the authors have succeeded in obtaining considerable picturesqueness and originality without incurring disproportionate cost. The Romford-road block has a projecting porch with a curved roof and crouching Caryatide figures (as shown on the detail drawing—they are indicated as standing figures in the general elevation); the lower story is treated with plain rusticated window openings, the upper story with an order, the columns of which, instead of being engaged in the wall surface, are placed standing free in front of the shadow formed by a small recess behind them; between the columns is a range of colonnettes just under the cornice, between which are arranged the windows of the two small lecture-rooms, the middle space being occupied by a sculptured panel at the point where the division-wall between them, as before noted, comes in. The circular-headed gables with an Elizabethan type of ornament in them, at the extremities of the Romford-road front and on the Water-lane front, are a little too pronounced, and want refining down. The entrances in Water-lane are picturesquely treated; that to the library has a semicircular porch, which develops into a small circular tower above, which on the upper floor forms part of the art-master's private room, the line of the tower being prettily indicated by two columns introduced in the room, thus appropriately giving a little architectural touch to the room occupied by the art-teacher; a top-light in the inner portion of the room prevents the light being interfered with by this device.

As already implied, we think the exterior design might be improved somewhat in execution, that it wants "pulling together," and refining a little; but even allowing for this, it appears to us to be the best of the exterior designs in the room—at all events of those that could be executed for the proposed expenditure; it has originality and picturesque interest, and is an agreeable variation from the architecture of respectable commonplace which too often characterises the class of buildings called Technical Institutes, and which is seen in many other designs in the room.

The second premiated design, by Messrs. Clark and Hutchinson, is architecturally a much plainer and more commonplace one than the first one, being an almost plain block of building with slight projections in the centre and at the ends, each emphasised by a small roof-turret on the centre line of roof, a slight

architectural treatment being given to the central entrance. The design is in good taste, but presents nothing of architectural interest. The plan is exceedingly symmetrical; the lecture-hall is on the centre axis of the plan, at right-angles with Romford-road, and is entered from the centre of this front. The access and cloak-rooms to it are well arranged, and the cloak-rooms are shut off by small lobbies instead of opening direct on to the corridor, which does away with the objection of having their entrances exactly facing each other. There is an area for light on each side of the lecture-hall, and around these and the lecture-hall the Institute portion is grouped in a large parallelogram, the corridors giving a complete circulation all round. The library is quite a separate department at the north-west angle, and the building trades' workshops are separately provided in a one-story block at the north-east angle, with glass roofs. In the main, this is perhaps a better way of treating them, in regard to light, than providing them in ordinary rooms with side-windows. They are connected with the main institute block by a through corridor from front to back. The library block is not very well planned in regard to the uses of the various rooms. The reading-room is placed on the exterior, towards the Green, and the lending-library in the interior, whereas the reverse should be the case, as long as top-light can be got for the inner rooms. The reference-library appears, at first sight, to be well placed in an inner position, but it may be observed that it is only separated by an open space of 25 ft. from the engineering workshops, from which it seems probable that disturbing noises would be heard. The librarian's room is not so well placed for general inspection as in the first plan. The main staircases in the Institute block are almost exactly where they are placed in the first design, and the lavatories behind them. On the upper floor the art section is placed along the Romford-road side, but with the intimation "north top light." In the case of the "advanced drawing-room" this light would be somewhat interfered with by the upper portion of the large lecture hall, which is very near to it. The small lecture theatres are placed symmetrically at the north-west and north-east angles of the upper floor; the access to them is rather far from the main stairs, and the doors not very well placed for convenient ingress and egress, but as they are not for a large number of persons this is not a serious drawback. The side-entrances in the main front are labelled for men and women respectively, and are each contiguous to the departments which would be most frequented by the sex for which they are set apart. There is a good deal of merit in the general orderly and simple disposition of this plan, and its place in the award is quite justified.

In the third premiated design, by Mr. T. Davison, a much less portion of the ground is built over, in consequence of the use of an extra story, which, however, is not nearly so good an arrangement. The lecture-hall here is placed at the Green and Water-lane angle (north-west angle), but with a corridor of access also from the central entrance in Romford-road, and with cloak-rooms, &c., to each entrance; a wasteful arrangement. The Library department, on the east side of the building, is well arranged, and the reading-rooms are secured from noise. The Building Trade workshops of the Institute department are all in the basement, approached by a cart-road from the Green; some of those which are lighted from the inner courts would certainly be deficient in light. The class-rooms are all on the first floor, towards Romford-road, and the Art School on the second floor over these. The access to these rooms, through the museum, which forms a kind of large lobby at the head of the central staircase, is rather crudely arranged; and we find in the upper floors long rooms with windows at the end, &c.

Generally speaking the plan wants simplicity. In the design, the treatment of the end wings, with rather heavy circular angle turrets, does not harmonise with the centre there is a want of coherence about it.

It is said that a great many well-known architects in the junior ranks of the profession are engaged in this competition. If so, a general review of the designs suggests the conclusion that planning is the department of architecture least studied among the rising race of architects. There are few of the plans which show any sense of the necessity for properly grouping the rooms in a large building, and many of them seem to have been designed without any realisation on the part of the authors of what the actual working of the plan would be, or of the special requirements of special departments. A considerable number of the competitors appear to think that the best thing to do with a reading room or a reference library, where quiet and freedom from disturbance are especially necessary, is to place it against the outside wall at the noisiest angle of the building, where the two principal streets meet. There are designs which are well and suitably treated in the elevations, and appear in this respect to be the work of a practised hand, as in No. 6 for instance, where a mere glance at the plan shows that the scheme is perfectly futile. No. 16, one of the most elaborate designs, shows the reading-room at the noisy exterior angle, and the space for the public in the lending library provided by a long passage at right-angle to the entrance and penetrating into the intestines of the building. The very first point to be aimed at in a lending-library is that the access to the lending-counter should be as direct and simple as possible; that it should immediately face the entrance provided for it, so that people can go straight in and out without jostling. In some of the plans the provision seems to be studiously the opposite of this. No. 20, with a very coarsely-treated elevation, has merit in the plan, which is very symmetrically laid out, and the access to the small lecture-rooms better provided for than in most others. No. 21 shows a very pleasing elevation, but the plan is hopeless. No. 3 is an effective design, and is superior to many in plan, but the plan wants principally of arrangement; look at the door to men's lavatory for instance, close to and nearly opposite the door of the board-room. Such *contretemps* in planning are not in accordance with the fitness of things. No. 4 has good points in the plan, which however is too scattered, and the irregular treatment of the vestibule to the lecture-hall is very clumsy; the perspective view is an effective sketch, showing character and originality. No. 42 shows a good deal of attention to classification in planning, with the serious defect that the large lecture-hall, which, as we have said, is one of the key-points of the plan, is merely got at by side doors out of an ordinary corridor. In such a plan there ought to be no doubt whatever where to turn for the principal room, and its entrance ought to be in a direct line from the street. The perspective of this design shows good taste and some originality of treatment, and the lending-library approach is properly planned; but the one central staircase leaves a very lengthy journey to some of the upper rooms of the technical department.

No. 47 looks at first sight a compact plan, but the reference-library is badly placed, and it is a piece of touching simplicity to put an "emergency exit door" from a corridor adjoining the large hall, when there is no extra door out of the hall itself. No. 45 shows cleverness in some points of its planning, but it is so arranged that every room in the building has either a west or a south aspect. In No. 59, which is very square and symmetrical in arrangement, the lecture-hall and one of the small theatres forming a kind of island in the middle between two corridors running from front to back, the author's passion for symmetry has induced him to put the lady performers' room open-

out of one corridor, and the gentlemen's of the other on the other side of the hall, with no common access, so that if a former or lecturer who does not know the building gets to the wrong door, and sees "ladies' room" on it, he cannot rectify his mistake without going all round the block to the other corridor. That is what comes of thinking how a plan will actually work in operation. The approaches and cloak-rooms for the public, to the large hall, are very symmetrical in arrangement, and the centre, opposite the principal entrance, occupied by one of the two smaller lecture-rooms, labelled "chemistry lecture-room." It never seems to have occurred to the author to consider why the chemistry lecture-room should be placed as if it were central *raison d'être* of the whole building. The access to the lending-library is well arranged, and the reference-library well placed. The entrance to the large hall in the middle of one side is a very bad way of entering such a room. As a specimen of the want of perception of the working of a building, we may observe that in No. 62, most elaborately got up set of drawings, the library department, which was particularly specified in the instructions to be arranged so as to be all within easy supervision of the librarian, is actually cut in two by the large central entrance-hall and staircase, so that the various rooms are completely separated from each other.

The two reflections which remain with us, after a review of the drawings, are, first, that the West Ham authorities are much to be congratulated on having set an example of a competition conducted with absolute fairness from beginning to end, and on having secured the best design for their purpose; and, second, that the study of planning must be good deal neglected among architects at present. The "Brown Book" of the Architectural Association shows a list of lectures on many subjects, but none on planning. We would suggest that they should specially take up this subject in a future year.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND.

By PROFESSOR BALDWIN BROWN.

I.—The Surviving Evidence.

AMONG our national monuments in the form of the great cathedral and abbey churches recently illustrated in the *Builder*, no one of a date prior to the Norman Conquest now ground at Peterborough, and possibly York and Winchester, and above ground Christ Church, Oxford, there are relics, in the first case of considerable extent, of pre-Norman buildings; at Stow, in Lincolnshire, there are still standing the transepts of a Saxon church that is thought by some to have once held cathedral rank; but, with these exceptions, the more important ecclesiastical structures of the Old English period have completely disappeared.

Yet these structures were in their day both numerous and imposing. As early as the end of the seventh-century Wilfrid erected a church at Hexham that was said at the time to have its like this side of the Alps, and at even in the twelfth century excited the admiration of the contemporaries of William I. Malmesbury. The Saxon Bishops had their cathedral churches, but these, often situated in obscure places, were, as a rule, comparatively unpretending. The dimensions of Stow do not exceed those of a large village church of to-day. In those cases, however, where the cathedral was also an abbey church it generally possessed architectural grandeur. The cathedral-abbey and the non-Benedictine houses of the first rank, belonging to wealthy and pushing communities, and such monastic churches as those of Winchester, Peterborough, St. Augustine's and Christ Church, Canterbury, St. Albans, Glastonbury, or Gloucester,

would have exhibited the best architecture of which the time and country were capable. It is true that the country had suffered greatly through the ruin of its monuments during the Danish wars, but this had been largely made up by an immense activity in building in the tenth century, in that era of monastic revival embodied for us in the ecclesiastical statesmen and artists, Dunstan and Ethelwald. If Sweyn had laid the country waste in the course of the last and most effectual Danish inroad, his son and successor was equally energetic in the work of restoration. At the time, therefore, of the Norman Conquest, the chief ecclesiastical sites were supplied with buildings corresponding to the demands of the age. Each structure of stone (for of wooden buildings there is for the moment no question) would probably have shown portions dating from the first age of the Saxon Church, before the Danish wars, while more would belong to the time of revival under Dunstan, and to the epoch of church-building which opened with the conversion of Canute. The fact that in every case these Saxon edifices have yielded place to later structures may be taken to show that, though sufficient in their time, they were not up to the later Mediaeval standard in size, solidity, or architectural character. It may be interesting to ask the question when, and under what circumstances, did this substitution take place?

It is worthy of note that, of the important Saxon churches, the one which lasted longest into the Mediaeval period was among the earliest of all. In the case of the monastery at Hexham, the researches of Mr. C. C. Hodges make it clear that Wilfrid's edifice was still serving as the nave of the extended abbey church up to the devastation wrought by the Scots in 1296. None of the others survived so long, but we need not assume that the Normans condemned them at once as intrinsically worthless. In the case of five of the most important cathedrals and abbeys, Canterbury, York, London, Gloucester, and Peterborough, and in that of Hereford also, the Saxon buildings were ruined by fire within a few years of the Conquest, and had necessarily to be rebuilt; while Rochester, Wells, and St. Frideswide's, Oxford, were in a greatly dilapidated condition. At St. Albans, at the end of the tenth century, a Saxon abbot set on foot, though he did not carry out, a grand scheme of re-building, which points to the fact that the actual structure was recognised as small or faulty. At the important sites of Winchester, Ely, Durham, Worcester, Exeter, the re-building seems to have been deliberate. Worcester was re-constructed by its Saxon Abbot Wulfstan, who pulled down the structures of his predecessor, Oswald, because they were not large enough, though he shed tears at an act which seemed to him to savour of sacrilege. At Exeter, the first Norman bishop was thought to show a certain want of spirit and ambition, in that he was content with the ancient buildings of the abbey founded by Athelstane and restored after the Danish wars by Canute. An ancient seal attached to some charters in the possession of the Exeter Dean and Chapter appears to give a representation of the façade of this edifice (Fig. 1). We may surmise that the round tower at the south is a relic of the work of Athelstane, while Canute's builders would be responsible for the remainder. Such as it was, however, the second Norman bishop, Warelwast, was not satisfied with it, and commenced in 1112 a new pile of which the well-known transept towers are surviving portions. At Winchester and at Ely the Normans found on the sites buildings dating in all essentials from the great era of Church restoration in the latter part of the 10th century. Such buildings might have stood for hundreds of years, but they were completely removed and new edifices constructed from the foundations by the first Norman bishop and abbot.

To understand aright this procedure of the Normans we must remember that the

age, as a whole, was one of extraordinary architectural activity. It was the ambition of each generation of builders to surpass all that had been done before, and the Normans of the second period treated the earlier efforts of their countrymen with the same scant courtesy that was shown at the Conquest to the Saxon edifices. It is a

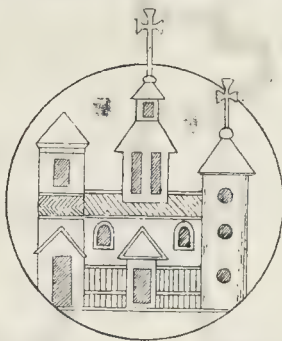


Fig. 1.—Exeter: From an old Seal.

striking fact that though Archbishop Lanfranc had erected from the foundations at Canterbury a new Metropolitan church that must, at least, have equalled the great abbeys at Caen, yet, within a generation, the Priors Ernulf and Conrad pulled down his choir and re-erected it on a scale of transcendently greater magnificence. The Norman abbey church at Peterborough is more than double the size of the Saxon structure burnt down in 1116, the plan of which, as shown in Fig. 2, has partially

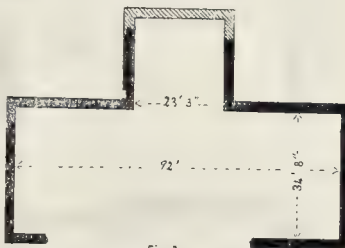
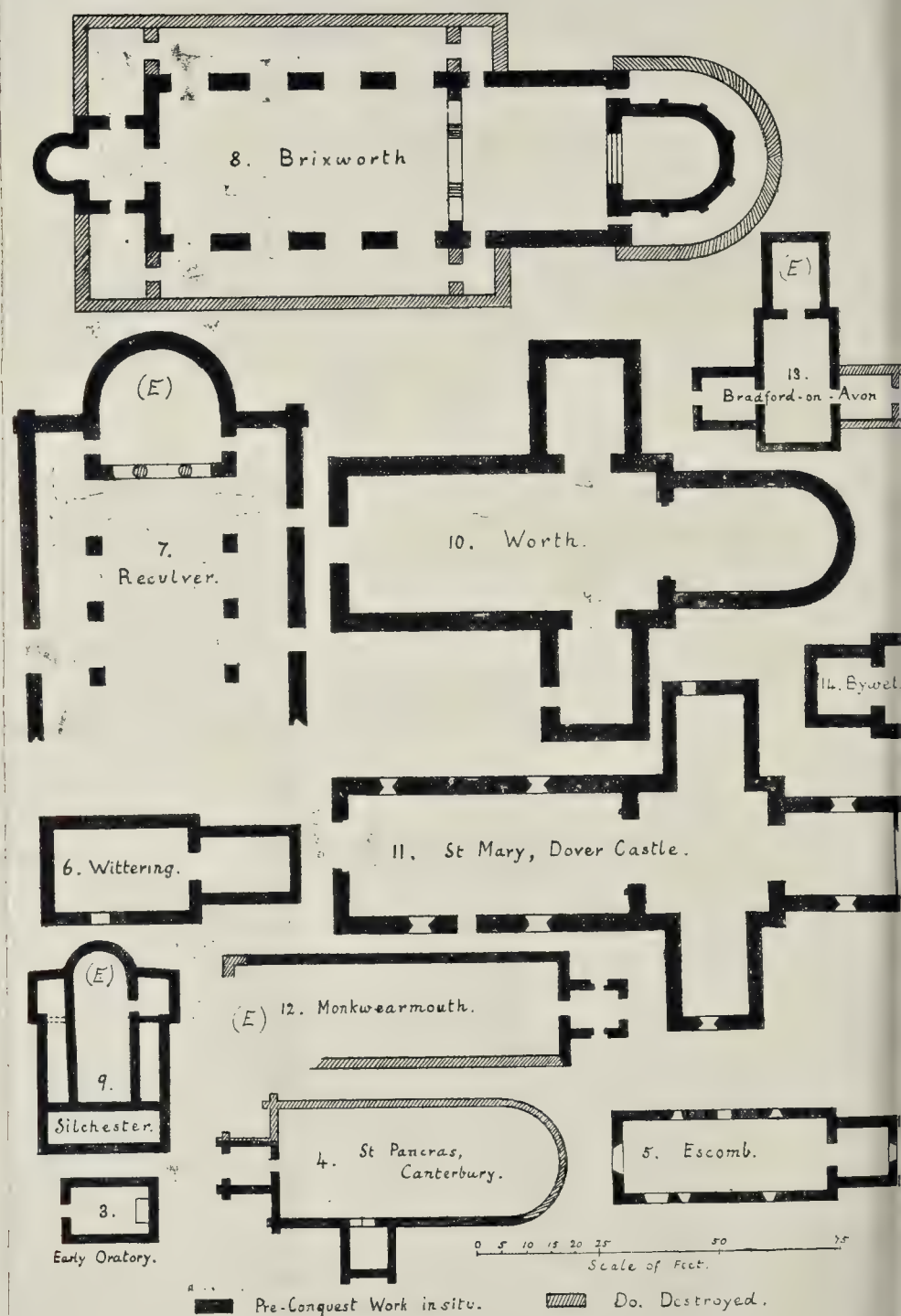


Fig. 2.—Peterborough: East End of Saxon Church.

been recovered, but the "glorious choir" of Conrad at Canterbury covered about four times the space of that occupied by the eastern part of the Cathedral of Lanfranc.

It is impossible to form a right idea of Saxon architecture as a whole, without taking account of these more important structures which have now perished. The actually existing remains of pre-Conquest work belong, as a rule, to comparatively small and unpretending buildings, mostly in the form of village churches. There are, however, sufficient of these relics to furnish materials for an interesting chapter in the history, not only of our national architecture, but of that of Western Europe as a whole. They help us to fill up, in our own case, the gap of some seven hundred years which intervenes between the last works of the Roman builders and the Norman Conquest, while from the more general point of view, they form a curious contribution to the evidence available for that important period of Western architecture, when the Romanesque styles were being gradually formed out of the remains of classical art as modified by the genius of the northern peoples. The present is the first of a brief series of papers designed to deal with some of the outstanding topics of interest connected with pre-Conquest architecture, especially as it is exemplified in existing monuments.



Figs. 3 to 14.—Comparative Plans of Pre-Conquest Churches.

it will conduce to clearness if we start with a cursory glance at the chief varieties of the plans of Saxon churches, so far as they are known to us. The series of plans given on the adjoining page, all drawn on one scale, gives a characteristic selection of the smaller and the more important pictures. To begin with the simplest and most common form, that of the oblong, single-ended oratory, without any distinct sanctuary, of the plan shown in fig. 3, we may say that this type preserved in more than one region of the country, and it will be sufficient to mention two small buildings of the kind that have left their traces on the map. It is known as St. Cuthbert's Isle, a rocky island or promontory according to tradition on the shore of Lindisfarne. It is of necessary to believe that the foundations there seen are as old as Cuthbert's, but they may possibly be so, and they will perpetuate for us the type of picture reared on countless sites by the Christian Hermits or missionaries in remote districts that they were winning the Gospel.

The next type is that in which the general form of the oblong cell is preserved, but a special altar-house or sanctuary is provided in the form of a second chamber cut off from the main body, opening out of the first. This sanctuary may take one of two forms. It may either be an apse or be terminated apsidally, or it may be rectangular like the main building. An interesting example of a single cell ending in an apse exists in part at St. Pancras, Canterbury, of which the plan is given in fig. 4. The structure is built of Roman brick, and may be pronounced an original ground to have the best claim to be considered Roman or Romano-British of ecclesiastical relic in the country, save the supposed early Christian church at Repton. The single cell with an adjunct in the form of a square-ended sanctuary is a common type, and appears to have been the normal form of the smaller Saxon churches. A simple example is shown in fig. 5, which is the plan of the interesting early church at Escomb, county Durham. In somewhat different proportions the same plan meets us at Wittering, in Northants (fig. 6), Boarhunt, Hampshire, Arlington, Sussex, and elsewhere. Most of the churches of the kind, however, like the well-known Cornton, in Hampshire, lost their original terminations. The majority of the original ecclesiastical structures that have come down to us are aisleless, but the larger cathedral and abbey churches had probably aisles.

The same difference is observable in the larger as in the smaller buildings. Some had aisles, others square-ended, sanctuaries. An abbey church at Peterborough (fig. 2) had a square, for Mr. J. T. Irvine reports that it is certain, although the actual east wall has not been uncovered. The presence of the figures shows that there was no space for a projecting apse. The church at Repton, Derbyshire, famous for its possession of a large crypt, which was cruciform and perhaps possessed side aisles, still displays a square-ended Saxon chancel. On the other hand, there are three completely aisleless churches known, two pillar churches, at Reculver, in Kent (fig. 7), and at Brixworth, Northants (fig. 8), and an apparently columnar basilica on a very small scale, at Silchester (fig. 9). These pillar churches are naturally apsidal. That of Repton has marked peculiarities which will be noticed in their place. An ambulatory around the apse, and this suggests the presence of a *confessio* or crypt beneath it, as in a familiar Early Christian pattern. No such *confessio* has, however, been found.

A more advanced type of plan brings into view transepts, and even a fully developed cruciform scheme. Embryo transepts of an Early Christian form may be discerned at Silchester, and complete ones occur in conjunction both with a square-ended and with a round presbytery. Of the latter, the best

example is Worth, in Sussex (fig. 10). The former occurs at St. Mary's, Dover Castle, and Repton, in Derbyshire; other cruciform churches are Stow, Lincolnshire; Norton, County Durham; and Stanton Lacy, Shropshire. St. Mary's, Dover Castle (fig. 11), is the only example that is perfect, the rest are in part more modern. At Dover and at Norton there is a well-preserved Saxon square tower over the crossing.

The western end of the Saxon churches was sometimes occupied by a porch, but more often by a square western tower. At Silchester there is found at the entrance end a wide narthex of the Early Christian pattern, while in other examples, as at Monkwearmouth (fig. 12) and St. Pancras, Canterbury, there are narrow western porches of a form peculiar to the Early Christian architecture of our own country. North and south porches are found at Bradford-on-Avon, Wilts (fig. 13). The square western tower, almost as broad as the church, occurs in very many instances, of which St. Andrew's, Bywell, on the Tyne (fig. 14) may be taken as typical. Finally, some of the greater churches had two western towers, or one western tower and a tower over the crossing. Our only evidence for these is literary, except in the case of Exeter, where, as we have seen (fig. 1), an old seal seems to give a view of the Saxon abbey church which stood till a few years after the Conquest.

NOTES.

THE verdict of the jury in the case of the Morecambe Pier disaster throws a significant light on the happy-go-lucky methods of Local Authorities in connexion with the building and supervision of structures of the kind in question. From the report furnished by the Board of Trade Inspector, it would appear that the authorities had made additions to the Morecambe Pier without submitting plans in the usual way to the Board of Trade, whose sanction for the new work had not, therefore, been obtained. The additions included the landing-stage which has collapsed with such disastrous results. The evidence proved that this portion of the pier, which was built in 1872, had been in a most unsafe condition for several years, a fact which could easily have been ascertained if the pier directors had taken the trouble to discharge their obvious duty. The bolts which secured the girder to the grating had been eaten away by corrosion. A little extra pressure was all that was necessary to bring about the catastrophe by which three people lost their lives, and many suffered from shock and, more or less, serious bodily injuries. Under the circumstances, we cannot be surprised that the jury should have censured the pier directors for having neglected to take steps to satisfy themselves that the structure was in a safe condition. The lesson was needed, and it is to be hoped that at other seaside places round our coast, those who are responsible for the stability of piers and landing-stages will take it to heart. In calling upon the Board of Trade to institute a periodical inspection of such structures, the jury revealed a perfect acquaintance with the real needs of the situation.

THE use of a higher pressure on the consumer's wires has long been contemplated by electrical engineers, as great economy in the weight of copper used in the mains would result. For example, if the pressure at which electricity was supplied were doubled, then twice as many consumers could be served without increasing the size of the mains. The drawback hitherto has been the want of really good lamps for high voltages. The Edison-Swan Company makes practicable lamps that can be used on a 220 or a 230 volt circuit, but does not guarantee them; some of them have failed after a very short life indeed. Notwithstanding this, the

Corporation of Bradford decided some months ago on this method of doubling the capacity of their mains, and within the last few weeks, the Vestry of St. Pancras have been quietly introducing this innovation. The pressure of the Bradford supply was originally fixed by their consulting engineer at 115 volts as being the highest pressure at which good lamps were available, and a simple two-wire system of distribution was adopted. It was subsequently altered into a three-wire system in order to meet the great demand, the pressure between the outer mains and the inner one being still kept at 115 volts, and the pressure between the two outer ones being 230 volts. The demand still increasing, and the mains threatening to become overloaded, the Corporation decided to supply all new customers at 230 volts, simply connecting them on to the two outer mains, their old customers being still served as before. This action of the Bradford Corporation was a great inducement to lamp-makers to attempt to make a good high voltage lamp. It is too soon yet to say whether any of them have succeeded, as a long time is needed to thoroughly test a lamp. Mr. Sydney Baynes, the Electrical Engineer to the St. Pancras Vestry, in a letter to the *Times*, says that he has had some 220-volt lamps in constant use for eighteen months with excellent results, and he has consequently initiated a movement to supply the Vestry's customers at 220 volts, instead of 110 volts as formerly. Strange to say, this movement is looked on unfavourably by many suppliers of electrical accessories, amongst others, who contend that until lengthened trials of 220-volt fittings have been made, there will always be liability to sudden extinction of the light, if not grave risk of fire. They also complain that a 16 candle-power lamp is the lowest candle-power high voltage lamp that can be got. Mr. Baynes meets their objections by saying that ordinary first-class fittings, combined with good workmanship, have long proved thoroughly efficient and safe in carrying even a higher voltage than that to be introduced at St. Pancras. He also mentions that 8 candle-power lamps at 230 volts are in the market, and that Mr. Stearn, the joint inventor with Mr. Swan of the incandescent lamp, has produced a high voltage lamp of 6 candle-power. He wisely refrains from making any comments on the efficiency of these small candle-power high voltage lamps. Of course, 220 volts is not a dangerous pressure to have in a house—a smart tingling is felt when touching two wires between which there is this pressure; but unless one be very susceptible to shock, or have very damp hands, it is not even unpleasant.

FROM the monthly report of Mr. Sylvanus Trevel, Chairman of the Sanitary Committee of the Cornwall County Council, it appears that much complaint has been made lately of bad smells at Truro owing to defective drainage, especially by passengers landing at the quay from steamers. There have been similar complaints all along the course of the River Kenwyn, in which sewage matter has been allowed to stagnate, and also complaints from similar causes at Helston. That in regard to Truro is of course the most serious, as it affects the greater number of persons, and it is a very serious matter for a town that visitors coming to it by water should be greeted with bad and unwholesome smells as their very first introduction to the place. It is to be hoped that the Cornwall County Council will at once bestir themselves to ascertain the causes of this evil, and abolish it.

FOR a further extension of the Borough Market some houses are being demolished on the east side of Stoney-street, Southwark. The workmen have brought to light a large piece of massive old wall of flint, chalk, and brick, having on its north



Chair-back with Coat of Arms in Cut and Tooled Leather.—Designed and Executed by Mr. H. Jacobsen.

face a filled-in four-centred arch, its voussoirs of red brick and with arched cellars beneath. In view of their position these are considered to be remains of Winchester House. On May 24, 1884, we published Mr. C. N. McIntyre North's drawings, with details and key-plan, of a square-headed window having two mullions, and a depressed four-centred arch (both filled in), of the bishop's house, as sketched by him before their destruction three years previously. Those fragments were discovered in pulling down to the ground level about 75 ft. westwards of the old walling on either side of Stoney-street, running parallel at a distance of 36 ft. with Clink-street. The bishop's house stood next west of St. Saviour's Dock, one of the most ancient "harbours" on Thames side. In Robert Wilkinson's plan of 1811, "Winchester House" and "Winchester-yard" are plotted between Stoney-lane (west), and the Dock and Church-street (east). A corresponding plan of 1827 seems to show that the east gable-end of the Gothic Hall abutted on the dock-side. The walls of the hall and its beautiful round window in that gable were again laid open by the fire of August, 1814.* The old buildings had been sold, in 1647, to one Thomas Walker, of Camberwell, for nearly 4,000*l.*, and were soon afterwards converted for commercial purposes. At the angle of the Dock and Clink-street, where are now Stave Wharf and Primrose-alley, were erected some water-works, which were finally cleared away twelve years ago. Winchester House was founded *circa* 1107 by Bishop Gifford, to whom is attributed the earlier nave of St. Saviour's Church; he was there succeeded by Henry of Blois. The last prelate of that see who lived there was Lancelot Andrewes, *obit* 1626, whose tomb and monument, with effigy, are in St. Saviour's. In 1663 Bishop Morley obtained

an Act for leasing the buildings and site, and for removal to Winchester House, Chelsea—familiar to readers of the Diary and Letters of Madame D'Arbly. Next south was the Bishops of Rochester's town-house, taken down in or about 1604; the estate, once known as Grime's Croft, and now occupied in part by the Borough Market, was given to the monks of Rochester by William, second Earl Warren, adjoining thereto was the "inn" of the Abbots of Waverley. In a "Note" on January 1, 1892, we gave a brief history of the Market, for an enlargement of which Mr. McIntyre North had prepared plans for the trustees. We may add that in Stoney-street, which marks the course of the ancient causeway to the passage across the Thames, nearly opposite Dowgate, was the house, Fastolfe-place, of Sir John Fastolfe, who carried on his Yarmouth trade at Pickle Herring Wharf, close by.

THE design in leather of which an illustration is given on this page is an example of the work done by Mr. H. Jacobsen in hand-cut and tooled leather. In this work the artist's design has to be done on transfer-paper, which is pinned on to the leather, and the outlines of the design are gone over with a tracing tool, which indents the design on to the leather without cutting it. The outlines are then cut half through the leather, and the space between the ornaments pressed down, so as to bring the ornament into relief, and the leather is undercut in that part of the ornament which it is desired to render most prominent. The hollows at the back, where the relief has been produced, are filled up with modelling wax, to render the back surface even. The background of the design is then punched by "star" and "ring" punches to give it a special texture and surface, so as to throw up the design, as seen in our illustration. The final process is the staining or tanning of the leather, after which, the design having

lost some of its sharpness in the process, has to be gone over with finishing touch with the modelling-iron, and is then ready for mounting. The art of treating leather in this manner is one which it is very desirable to see revived, and is capable of producing excellent decorative effect of a permanent character. For those who may wish to try this method of work for themselves, Mr. Jacobsen has produced a descriptive guide as to the details of the process,* with illustrations of the kind of work that may be produced. We do not admire the style of all the designs in the book, many of which are not sufficiently conventional; but the illustration we give (which is superior to those in the book) shows that a good standard of decorative work can be produced by this process.

THE system of insulting members of the architectural profession by offering them bribes to make use of special goods has perhaps seldom been attempted in a barefaced manner as by a person who calls himself "Artistic Furniture Maker" and who has sent round to the architectural profession a printed circular to the following effect:—

DEAR SIR,—In order to meet the requirements of a few of my business friends, who have now the pleasure to inform you that I am prepared to offer exceptionally good terms in respect to introductions you may be able to send for supplying my artistic furniture to your client. As my business is strictly a wholesale one, it will be necessary to execute all orders through you, and direct to your clients, and upon all goods purchased through your instrumentality, I would quote price to allow of an agreed-upon profit to yourself."

On Thursday morning we received copy of this circular from no less than a different architects, accompanied naturally by expressions of the greatest indignation.

* See also the views in "Londina Illustrata," and the *Gentleman's Magazine*, December, 1814; and the water-colour drawing, 1810, in the Soane Museum.

* To be obtained from the author, 109, Great Portland street.

tion; another copy of it was sent to the Editor of this journal at his private address. Earlier in the same week two architects sent us copies of a circular received from an ironmonger's firm, whom we will call "W. & Co., commencing with the words "We observe that we have several contracts in hand just now. We do a large trade with architects, and many of them schedule our goods, and allow them a good commission." The document proceeds:—

"If you think anything can be done, we shall be pleased to send a large list subject to 20 per cent. from which you could find almost anything requisite in the trade, or if you could give us an introduction to your builders, we would allow a commission on orders resulting. Kindly think matter over, and let us hear from you in course."

It is true that "many architects" schedule the goods of this firm and receive large commissions from them, it perhaps can hardly be surprising that tradesmen who know nothing of professional practice and professional honour and integrity should imagine that one architect is the same as another, and that inducements which have been accepted by some could be offered to others; and possibly Messrs. W. & Co. may really believe that what they are doing is only in the ordinary course of business. It will, perhaps, not matter in a new light to them if we explain that any architect who was known by the Council of the Institute of Architects to have accepted commissions of the kind they offer would, if a member of the Institute, be liable to expulsion from its ranks, and that in sending such proposals to men of any standing in the profession they are doing the very worst thing for their own interests.

A DAY'S WALK IN SOUTH DUCKINGHAMSHIRE.

ON June 25, 1643, the day after he died at home, they buried John Hampden in the church which stands within the shadow of his ancestral home. As he was born in London in 1594 (*Wood's Athenæ Oxon.*, edit. Bliss) it seemed very appropriately to devote a day to walking through the country—unsurpassed for verdant beauty of woodland, hill, and valley—of Hampden and Milton, the Fleetwoods, Waller and Burke. Starting, then, from the sixteenth-century "Treaty House," at Uxbridge, where Charles I.'s commissioners met the Parliament men in 1645, later a home of the Bennets, and now the "Crown" inn, we enter the county on crossing the Colne, and see before us the high road, which, aversing Gryme's Dyke on the remoter side of great Missenden, and the Ickneild Way at Wendover (for which Hampden and Burke sat Parliament) winds through the Chiltern Hills, Aylesbury, and so along Akeman-street into Oxfordshire. We first reach Denham, one of the prettiest villages roundabout, its meadows and oves watered by the Colne, and the Mease or Isbourne, the latter running down a valley, in which lie Great and Little Missenden, Amersham, and the two Chalfonts. The church, finely Perpendicular, with a Norman tower, has been carefully restored. It contains several memorials of the Peckhams and Bowers, and a brass (1545) to Agnes Jordan, last Prioresse of Syon. In 1715 there were found in the church some singular monumental devices, consisting of fluted bases bearing flowers of horn and silk, with warden leaves. At Denham Court Lady Bowyer concealed Charles II. when a fugitive. Denham place, a large plain house, locally famed for the number of its windows, was built in 1667 by Sir Roger Hill, of the prevalent red brick. Next beyond is Fulmer, in a vale; its church rebuilt, or the most part, in the Perpendicular style, by Sir Marmaduke Dayrell, in 1610, but since enlarged with a new chancel, vestry, and south aisle, by and in memory of Mrs. Dent, of Fernacres, in this parish. Some of the graves are dug nearly north and south. Within the parish is the greater portion of Bulstrode Park, an ancient estate and containing some earthworks. Lord Chancellor Jeffreys bought Bulstrode from Sir Roger Hill, in 1686, and built a house there. His son-in-law, Charles Dyve, sold the property to William Bentinck, first Earl of Portland, who retired thither on William III.'s death. That house, which Mrs. Montagu's letters and last

century's political life should render famous, with gardens laid out by Repton, was rebuilt circa 1865, by the Duke of Somerset, of Bath stone and deep-toned brick, after what is termed the old English manorial fashion. A left-hand road takes us up to the wide expanse of Stoke Poges Common, brilliant with flowering heather, which separates us from West End where lived Gray. The middle road leads to Gerrard's Cross and Beaconsfield (more correctly Beckonsfield), whose former rectory-house served for a while as a subsidiary to the Benedictine convent founded 1265 at Burnham by Richard, brother of Henry III., and King of the Romans. Finished in 1543, by Rawson, Canon of Windsor, it is perhaps the oldest parsonage in England. In an introduction to his account of Eltham Palace (1828), J. C. Buckler writes:—

"Its basement story is built entirely of brick, glazed with chequered patterns; and its upper story with lofty gables and roofs, is formed of strong timbers closely placed and plastered between. The house encloses three sides of a quadrangle, the fourth having a high wall and the gateway. The principal staircase is attached to the north-side; it is semi-cylindrical, and composed of timber, and though perfectly plain is a curious feature of the building. . . . Here are horse-loads of solid timber in dark passages, of great lengths and little use. . . . The floors were formed of enormous planks, and the steps to them of massy blocks, on which the axe almost labours in vain.

Burke, with his son and brother, and Waller, lie in the churchyard; the last-named in a well-known tomb bearing an epitaph by Rymer, of the Federa. A first cousin of Hampden, he was born at Stock Place, in Coleshill, a detached part of Hertfordshire, near Amersham, but succeeded to his family's seat, Hall Barn, in this parish, which was afterwards enlarged by Colin Campbell, and is illustrated by Hulsberg in the "Vitruvius Britannicus." In 1832, Sir Gore Ouseley, Bart., Ambassador to Persia, bought the property from H. Edmund Waller. Burke purchased Gregories, since Butler's Court, from the Wallers in 1760. It is at his country home that we like best to think of Burke, observes his latest biographer; there he was happier than elsewhere and happiest there when the house was full of guests. There he received Johnson, Garrick, Reynolds, Macintosh, and Fox, and gave shelter to Crabbe and the two Brahmins, for he was as charitable as Goldsmith. His widow sold the house, which was burnt down shortly after her death in 1812; the stables remain, and some grass-grown meadows near the road to Penn mark its site. Beaconsfield, with its wide street of low, white houses shaded by trees, has, like Amersham and Wendover, lost but little of its old-world aspect.* On Fulmer Common stands the Reid Memorial Church, designed by Sir William Temple in the Byzantine style—see the *Builder*, vol. xvii., 588, 616.

The main road leads on northwards to Chalfont St. Peter, bounding on the right the finely-timbered Chalfont Park (the house designed by Chute for General Churchill), through which runs the Midsbourne. Here we enter the Chalfont valley, a high range on the east dividing us from the valley of the Colne. Beyond the Park, on the right, is the Grange, memorable as the home of the Quaker Penningtons, whence Isaac Pennington was taken to Aylesbury Gaol. Isaac married Lady Springett, whose daughter, Gulielma, married William Penn in 1672. St. Peter's was erected temp. George I.; it has an embattled west tower with turret, and a later east end in the Early Pointed style—all being of red brick; at the corners are some squared stones from Verulam. A road by the church leads west-



Milton's Cottage, Chalfont St. Giles.

wards to Layter's Green, and to Jordans (see our "Note," Sept. 15, 1894). Abraham Newland,

* In the King's Library, British Museum, are several views of Bulstrode (one by H. Repton), Gregories, the old rectory, and Burnham Abbey.

for thirty-two years chief cashier to the Bank of England, had a house in this parish. On reaching a bye-road to West Hyde and Harefield (also associated with Milton and his "Arcades") we turn from the high road into the valley, and walk through the riverside meadows to Chalfont St. Giles. At the restorations here by Street, Mr. Seddon, and Mr. J. Oldrid Scott, the square bases of two Norman pillars, and of the chancel arch-piers, were preserved. A beautiful double piscina with a middle shaft, and a lancet window, denote the early English period of the chancel, but its east window is about one hundred years later, circa 1320, and as restored by Street, its central and two sub-arcuated side-lights present a highly interesting example of a blending of perpendicular and flowing decorated forms, as do also the two-light side-windows of the north aisle. On each side of the chancel-arch is an unusually large hagioscope. Many of the fourteenth-century frescoes remain; one is believed to depict a donation of rectory and advowson by Bradwell Priory to the See of Lincoln, which included this county until 1845; a figure dancing before a banquet-table, resting prone on her hands, is perhaps Herodias' daughter. There are some Gardiner brasses, with one to Thomas Fleetwood (and his numerous family), of the Vache, great-grandfather of Cromwell's son-in-law, and ancestor of Colonel George Fleetwood, regicide, who forfeited that property on attainder. The carved-oak altar-rail was given by Francis Hare, Marlborough's chaplain at Ramilies and Blenheim, Bishop of Chichester and Dean of St. Paul's, and it is believed, comes from the latter cathedral. Beneath a house in the village street is an old lych-gate, like those at Heston and Hayes (Middlesex), turning on a stout central spindle, and retaining its two pulley-wheels. We rejoin the high road at the "Pheasant" inn, whence a bye-road skirting the Vache beech-woods leads northwards to Chenies and Latimer, whither Charles I. was taken after the battle of Holdenby, it being then in dower to Elizabeth, Countess of Devonshire. At Latimer was found a Roman villa. Within short distances are the Vache, an ivy-grown house, whereof some parts date from the fourteenth century; Bottrells, where lived Thomas Ellwood; and the Grove, a seat of the Gardiners. Sutton, founder of Charterhouse, married Elizabeth, widow of John Dudley, of Stoke Newington, and daughter of John Gardiner, of the Grove, which latterly served as a Quakers' "Meeting-house" until the erection of that at Jordans.



Quakers' Meeting House, at Jordans.

The main route takes us to Amersham, or Hagmondesham, represented by Waller in Parliament, one of the many possessions given by

* See the *Builder* "Note" cited in text. Street was architect to Oxford diocese. Of parish churches in this county, he restored Aston Abbotts, Bradenham (Cheddington), Dorton, Hardwick, Huicott, Umire Lillingstone Dayrell, Soulbury, Wendover, and High Wycombe; he also designed St. Peter's, at Chalvey, near Slough; St. Ann's Chapel-of-Ease, at Wycombe Marsh; St. James and the schools, New Bradwell; All Saints', Nash; St. Mary's, Westcott, near Waddesdon; and the memorial screen, Eton Chapel. Sir G. G. Scott, who was born at Gawcott vicarage, Buckingham, restored the parish churches (in this county) of St. Mary's, Aylesbury; SS. Peter and Paul, Buckingham (continued by his son); and St. John's School, Buckingham, Chesham, Grandborough, Hillesden, Latimer (an enlargement of Bore's church, built 1441), Olney, Padbury, Shalstone (rebuilt 1828), and Wing (Saxon arcades, crypt, and polygonal apse). He also designed St. Mary's, Wolverton End, Stony Stratford, and Weston Turville Rectory-house. St. Mary's, Slough, erected in 1837, has been enlarged by Mr. J. Oldrid Scott, who also has restored the church at Horton, where Milton's mother and first wife are buried. This list does not profess to be complete.

* See the *Builder*, June 16, 1892—"A.A. Summer Visits." The almshouses, founded 1603, by the Lady Anne Russell (Countess of Warwick), were pulled down three or four years ago.

William I. to Geoffrey de Mandeville, and owned by the Earl of Warwick temp. Edward IV. In James I.'s reign the daughter of William Tothill, of Shardeloes, brought it in marriage to the Drakes, whose chapel in the church has monuments by Scheemakers and Bacon. On the outskirts of the town—the lines of its houses broken by many a white gable and projecting front—is Little Shardeloes, which some consider to be the old manor house. We now emerge into the Chiltern Hills, whose chalk rock, once quite covered with forests of beech, rises to a height of 900 ft. at Wendover. We turn aside into Shardeloes Park, seat of the Tyrwhitt-Drakes, its mansion, built by Robert Adam, 1759-61, with a Corinthian order for portico and pediment. Traversing the park and meadows, by the river, for a mile or so we come to Little Missenden and see the home of Benjamin Bates, M.D., who went with Flaxman to Rome, and for whom Angelica Kauffman painted her portrait. A warm patron of the fine arts, Bates died here at a very advanced age in 1828, being the last survivor of the Medmenham Abbey Club, whose imputed licence he always denied. The Abbess of Burnham acquired the manor in 1399. The little church has a fine Norman font and four bells, two said to be King John's gifts.

Rejoining the high-road we advanced to Great Missenden, where are the source of the Miss, or Mease, and scanty remains of a Benedictine monastery founded by Sir William de Missenden in 1133, or perhaps earlier by the D'Oyleys. The early English cruciform church was repaired and enlarged in 1830; its low embattled tower is oblong on plan, having its longer sides set north and south, like that at Chenies. On Castle Hill are some entrenchments, conjectured to be Roman. Following the Prince's Risborough-road for more than two miles we gain Hampden House gates. These open into the Queen's Gap (cut, traditionally, for a visit of Elizabeth) a wide clearing of greensward and bracken lined with elm, beech, lime and Spanish chestnut trees, rising for a mile and a quarter to the house's south front, opposite which, through the grounds may be traced Gryme's Dyke. This front, of red brick and partially stuccoed, was erected by the Hon. Robert Trevor, descendant of Hampden's daughter Ruth, and successor, in 1754, of John, twenty-fourth, hereditary Lord of Great Hampden. The property belongs to the Earl of Buckinghamshire, who traces descent from Mary, Hampden's youngest daughter. Not far distant are Chequers, seat of the Russels, Cromwell's descendants; Great and Little Kimble, supposed to be named after Kunobelin, and once owned by the Hampdens; and Stoke Mandeville, where (in Prestwood and at Great Kimble) are the lands for which Hampden resisted the levy of ship-money. More remote, beyond Tring, is the Beacon at Ivinghoe, on whose summit they kindled a fire to speed to Harrow the news of Edge Hill.

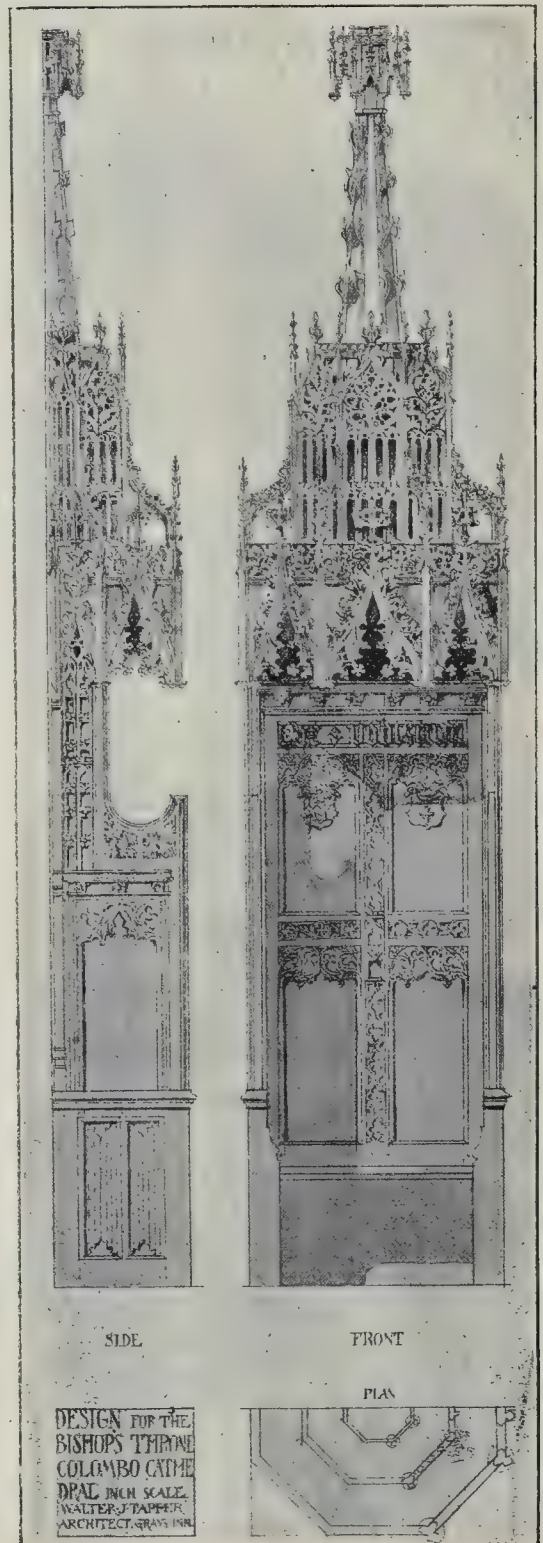
Despite Lord Nugent's dissection of Hampden's supposed remains, the precise cause of his death and the position of his grave are yet unknown. The house contains, we understand, only a reputed portrait that can be associated with him living. The sorry memorial on Chalgrove Field is in a shamefully neglected state. So after reading the inscription he set up to his first wife in the church chancel, opposite to that of his latter namesake, we pause to view the widening valleys, their sides clothed with dense woods, varied by the lesser growth of juniper, box, and holly, amongst which he passed his domestic life, and to recall Clarendon's words:—

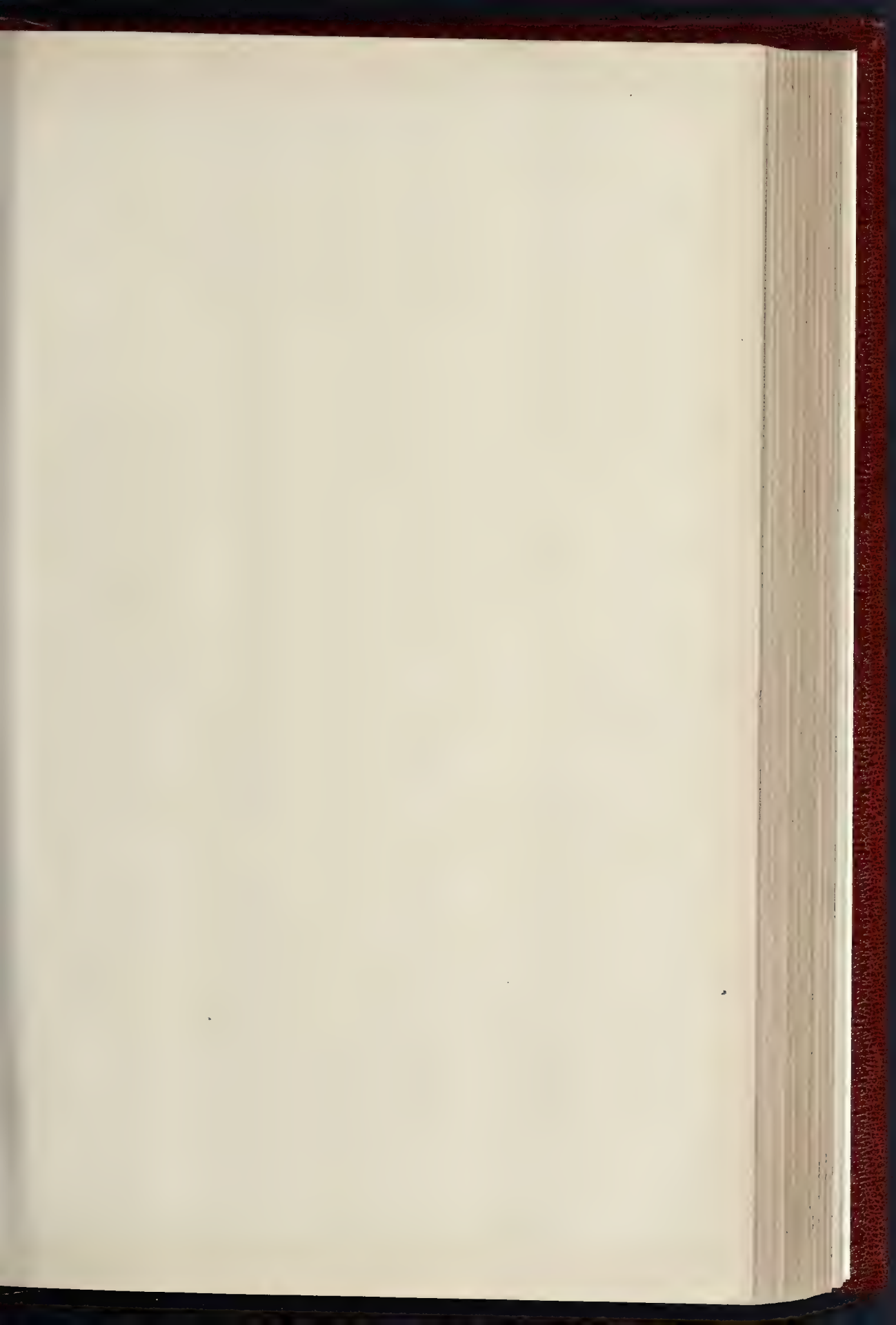
"When this Parliament begun (being return'd knight of the shire for the county where he liv'd) the eyes of all men were fix'd upon him as their *Patria Pater*, and the pilot that must steer the vessel through the tempests and rocks which threaten'd it. And I am persuaded his power and interest, at that time, was greater to do good or hurt, than any man's in the kingdom, or than any man of his rank hath had in any time; for his reputation of honesty was universal, and his affections seem'd so publicly guided, that no corrupt or private ends could byass them."

BISHOP'S THRONE, COLOMBO CATHEDRAL.

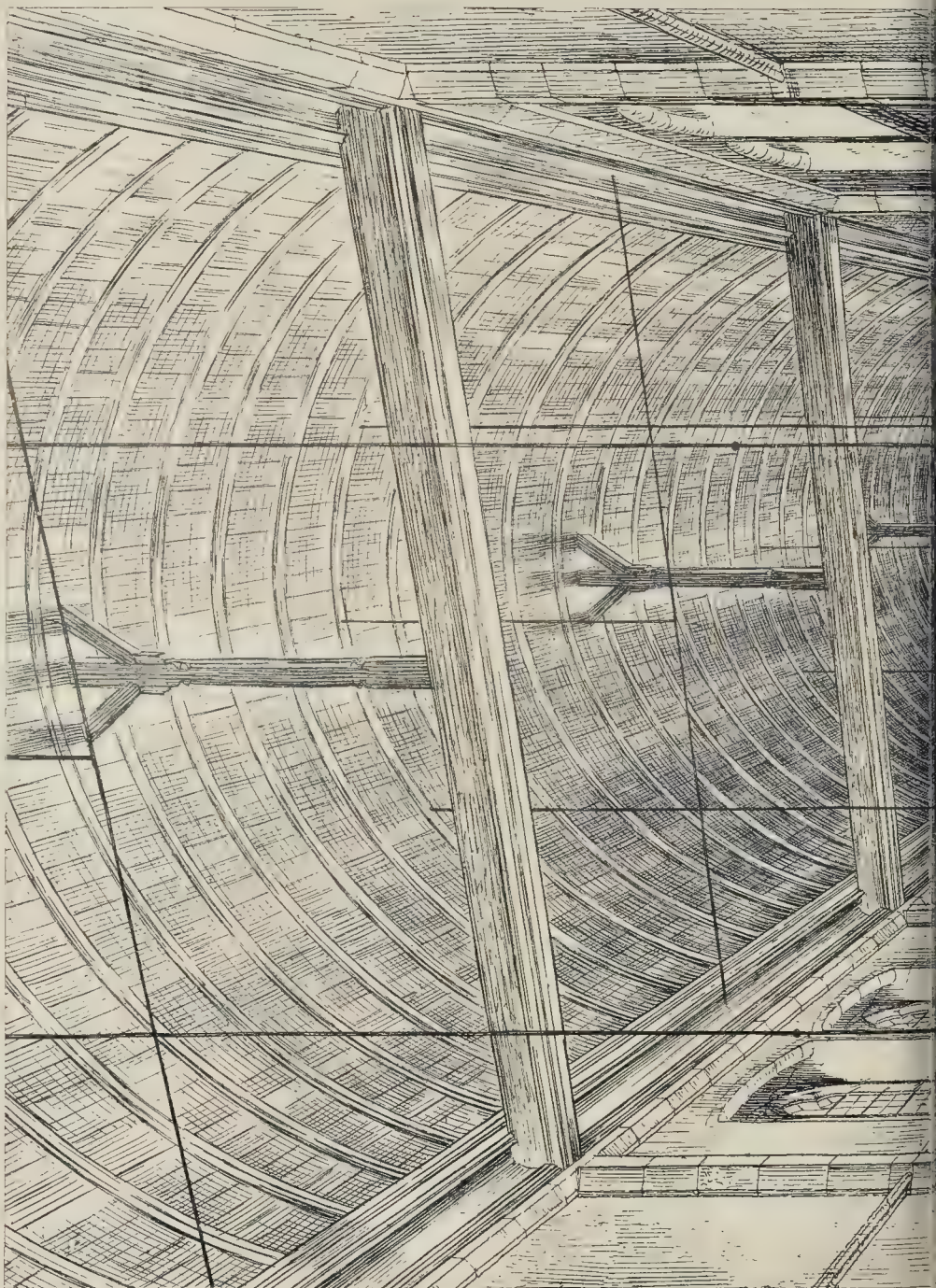
This throne was placed in the cathedral church of Ceylon as a memorial to Bishop Chapman, its founder, by his surviving daughters.

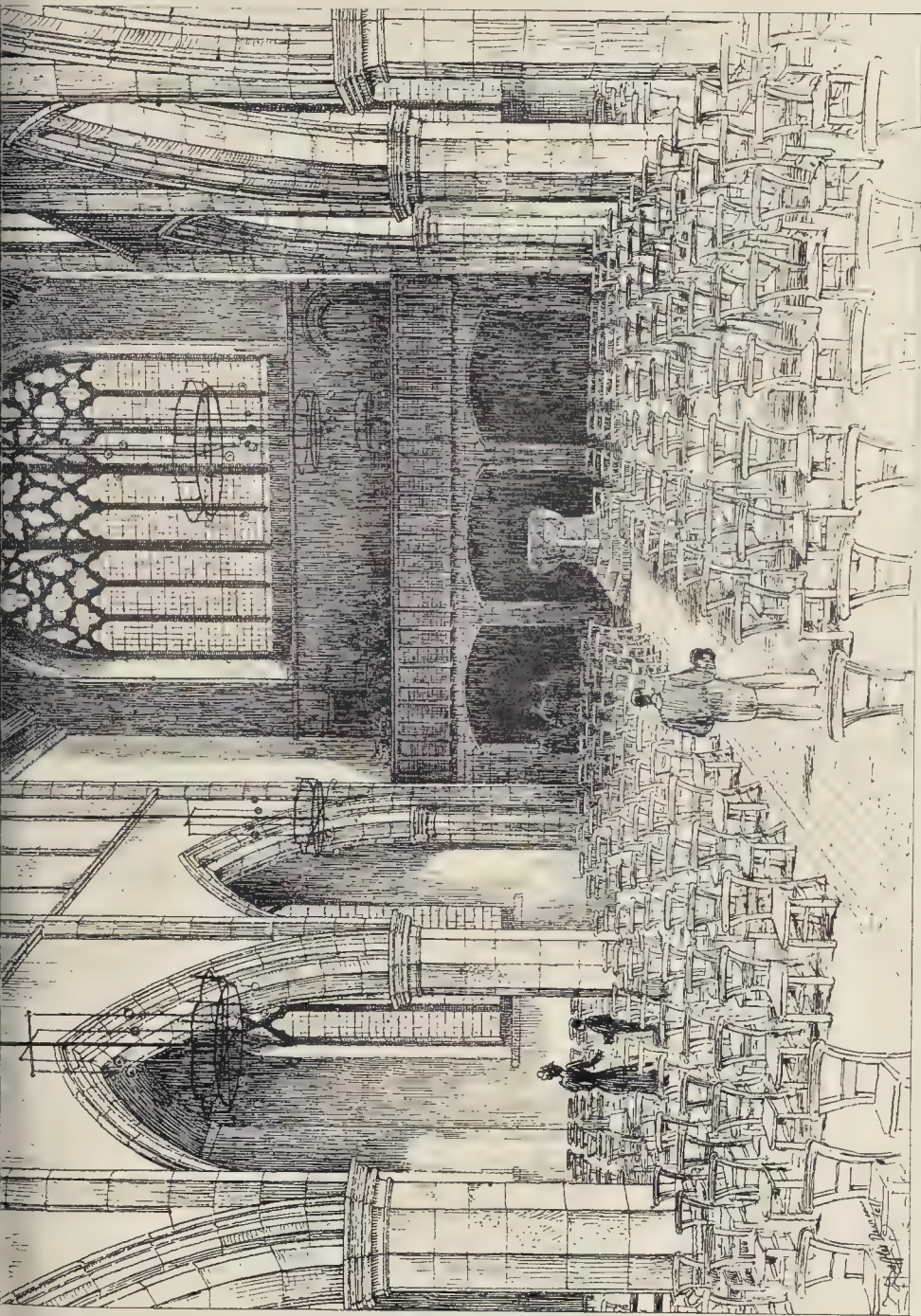
It is made in teak, by native workmen, who were supplied with models for the carving by Messrs. Rattee & Kett, of Cambridge. The design is by Mr. W. J. Tapper. The drawing was exhibited at the Royal Academy.



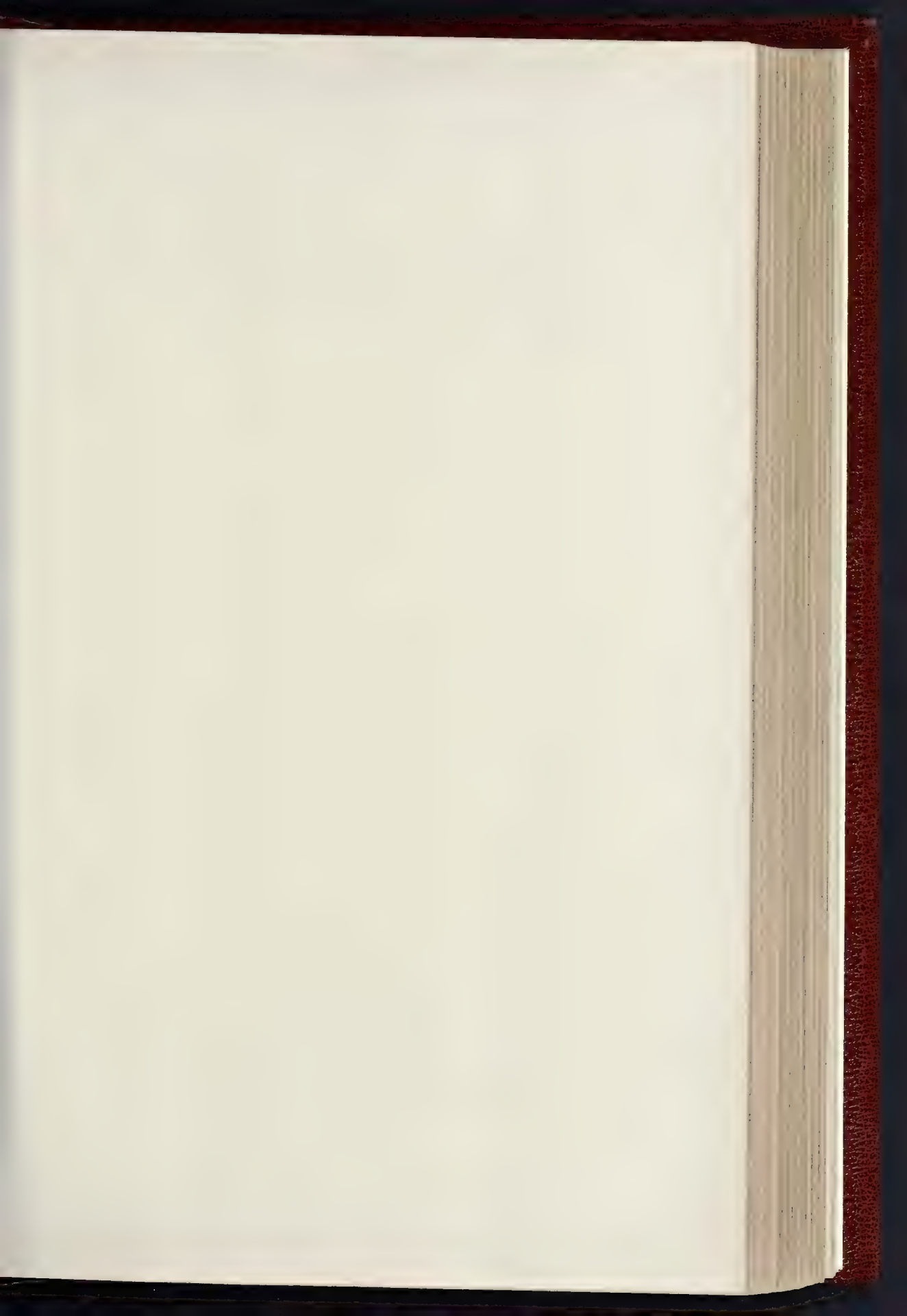


THE BUILDING SEPTEMBER 28, 1895.





INTERIOR, ST SWITHIN'S CHURCH, LEWISHAM — MR. ERNEST NEWTON, ARCHITECT

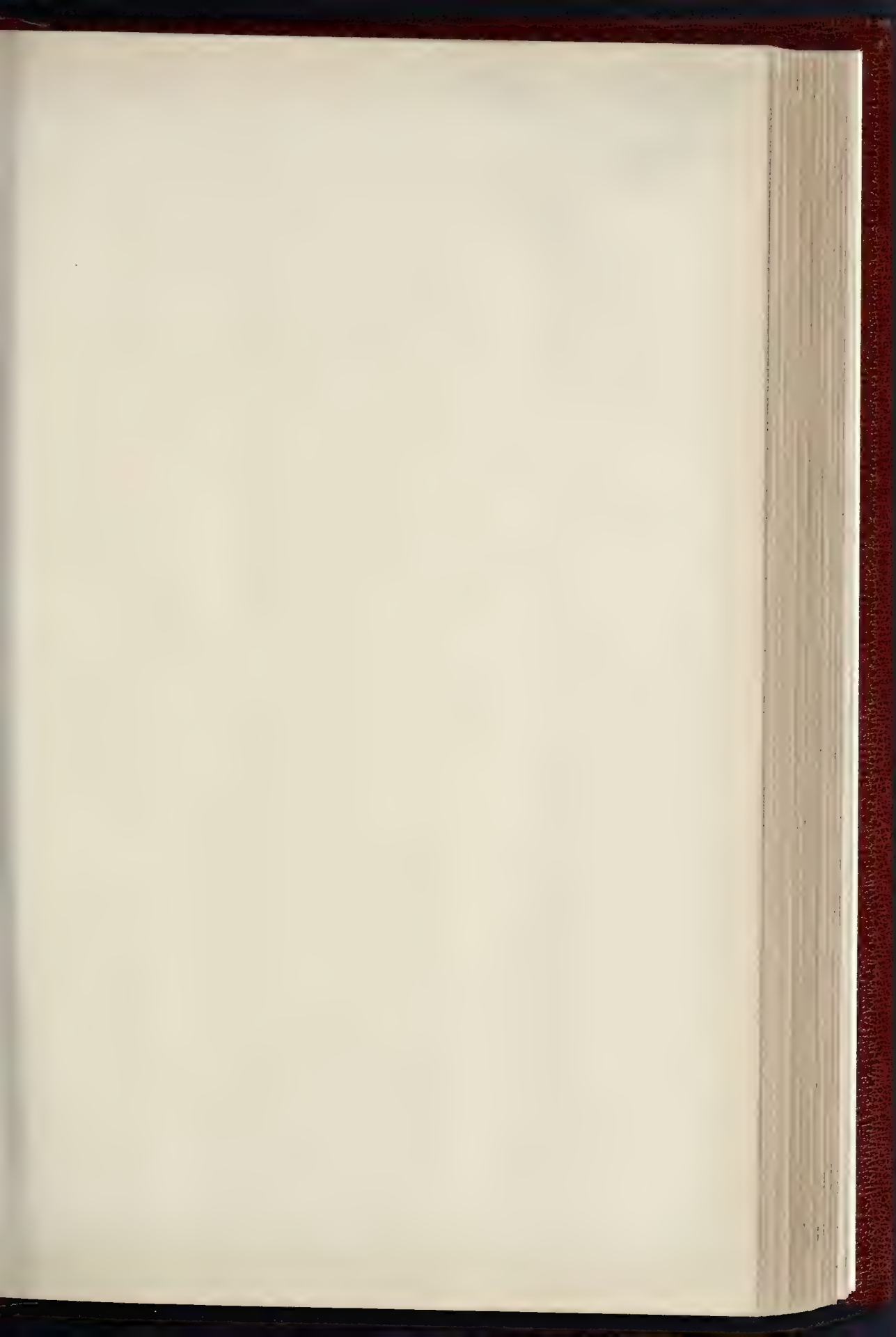


THE BUILDER, SEPTEMBER 28, 1895.





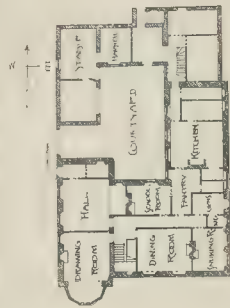
THE PRUDENTIAL ASSURANCE COMPANY'S OFFICES, EDINBURGH.—MR. ALFRED WATERHOUSE, R.A., ARCHITECT.



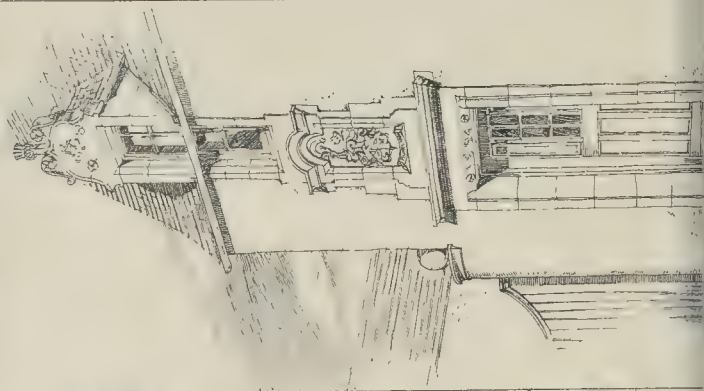


FROM THE SOUTH-EAST.

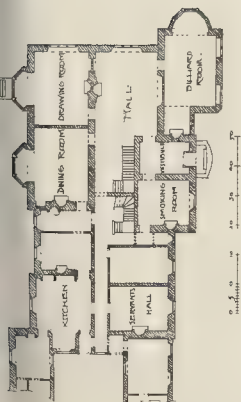
STRONAGHULLIN-ARGYLLSHIRE. FOR R.G. GRAHAM-CAMPBELL-ESQ. OF SHIRVAN. R.S. LORIMER, ARCHTCT. 49, QUEEN-STREET, EDINBURGH.



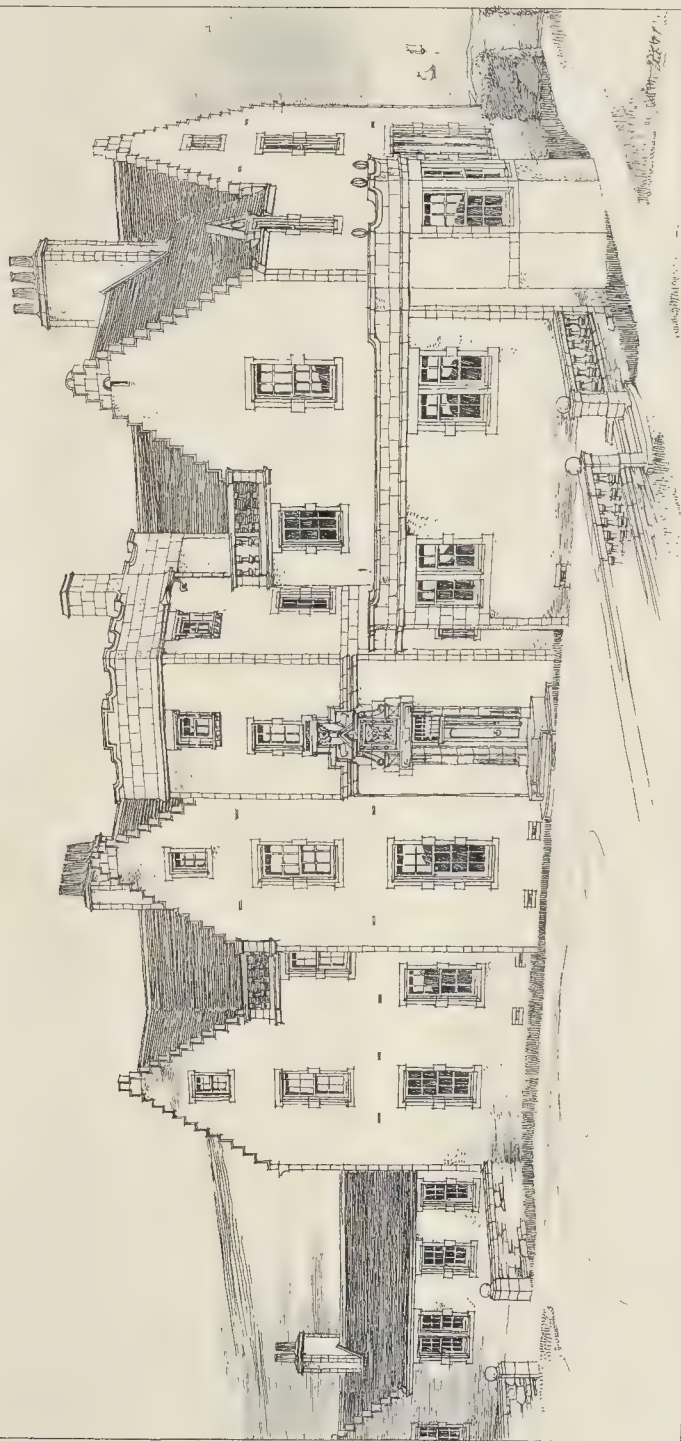
PLAN OF THE GROUND FLOOR.



ELLARY ARGYLLSHIRE.
 FOR J. K. LARRATT ESQ.
 RESTORATION
 AFTER FIRE
 AND ADDITIONS.
 49 QUEEN STREET.
 EDINBURGH.
 R. S. LORMER ARCHT.

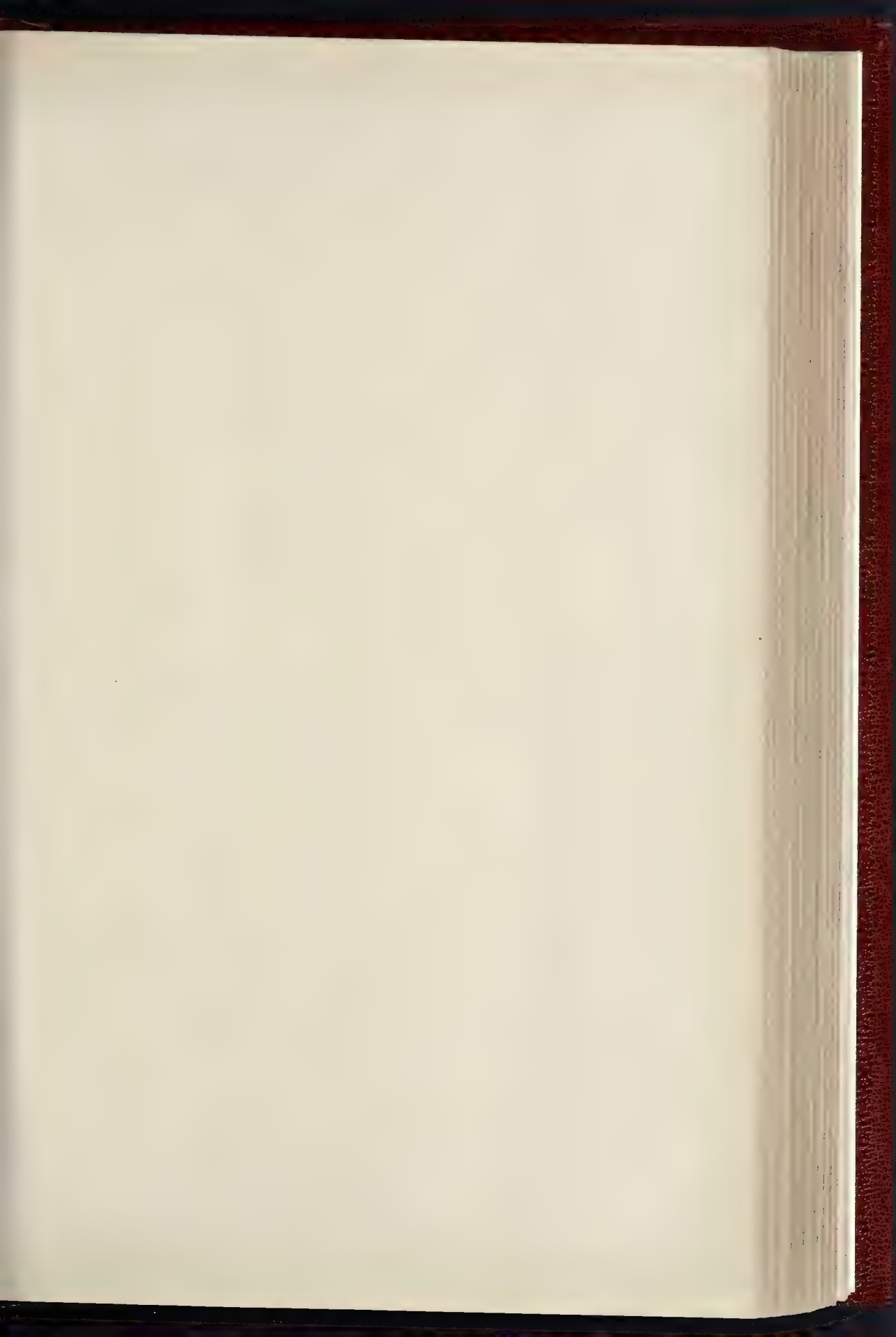


PLAN OF THE GROUND FLOOR



PHOTOGRAPH BY J. K. LARRATT ESQ. 1891

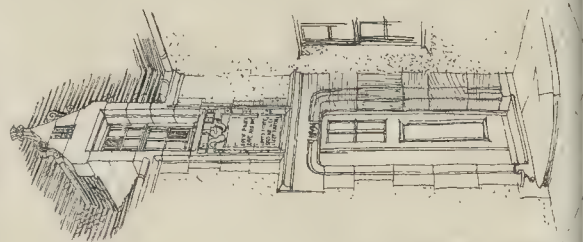
MODERN SCOTTISH HOUSES BUILT IN LOCAL STYLE MR R S LORMER, ARCHT.



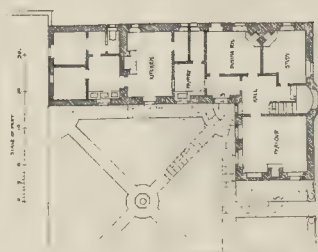


VIEW FROM THE NORTH-WEST.

NEW MANSSEL WEST-WENT'S FIFTH SCHOOL, ARCHT.
J. H. G. & SONS, STRAIGHT.



PLAN OF THE SCHOOL BUILDING.



Illustrations.

PRUDENTIAL ASSURANCE COMPANY'S BUILDINGS, EDINBURGH.

THE perspective view which we publish to-day represents a new block of buildings about to be erected by the Prudential Assurance Company for the accommodation of their Edinburgh branch, on a site at the corner of St. Andrew's-square and South St. Andrew's-street. The buildings, which have been designed by Messrs. A. Waterhouse & Son, are to contain not only public and other offices for the use of the Prudential Assurance Company but also some thirty-five private offices, occupying the four upper floors, as well as four shops on the St. Andrew's-street side.

The most striking feature of the exterior will be the octagonal angle-tower at the junction of the two principal fronts, which will rise to the height of more than 100 ft.

The elevations, originally intended to be executed in stone and red brick, are now at the express instance of the Municipal Authorities to be entirely of stone (Dumfriesshire), the lower portion of the front being of Peterhead granite up to the ringing of the large arches.

That part of the building reserved by the Prudential Assurance Company for their own use is entered by an angle doorway at the base of the tower, and consists of a large public office, 49 ft. by 24 ft., with private offices and store-room behind. Of these, the public office is to be lined throughout with light coloured faience.

The entrance to such private offices as are not reserved by the company for their own use will be through a doorway situated at the other end of the St. Andrew's-square elevation, and leading directly to the staircase and hydraulic lift.

In connexion with these offices are provided strong rooms in the basement.

Each shop of the St. Andrew-street front, besides one or more large rooms on the ground-floor, with coal-vaults, &c., in the basement, will be provided with further accommodation on a mezzanine floor, introduced between the shops and the general first-floor level.

MURCH OF ST. SWITHIN, HITHER GREEN.

Of this church the nave and aisles only have been built at present. The view shows the exterior looking westward.

The general scheme of the church is simple, the only elaboration being in the window tracery. The ceilings are intended for painting.

I am indebted to Mr. W. R. Lethaby for the whole of the detail work. During a prolonged absence from England on account of ill-health, while the work was in progress, Mr. Lethaby kindly took over my responsibilities, and I need not say that the church gained much by this arrangement.

The whole of the work was done by Messrs. Farmer, of Braintree, Essex, to our complete satisfaction. The drawing is by Mr. Raffles Davison, and was made on the spot.

ERNEST NEWTON.

MODERN SCOTTISH HOUSES BUILT IN LOCAL STYLE.

THESE two sheets, showing various houses built in Scotland from the designs and under the superintendence of Mr. R. S. Lorimer, architect, illustrate the principle of employing in all cases local material and local workmanship, and thus producing houses characteristic of a stone-building district, instead of importing brick, half-timber work, and other materials and treatment foreign to the district. This is a principle which has been often spoken of with approval in our columns and elsewhere. Whether it would always be strictly appropriate in the building of a mansion of the largest size and importance, in a district where no building on that scale had previously existed, may be a question. But apart from such a case, there can be little question that in new houses of the average dimensions, the majority of the buildings with the country in which they are erected is best secured by this method, and our readers will probably agree with us in thinking that Mr. Lorimer's experiments in this direction are of considerable interest. The following description of the various houses furnished by the architect:

STRONACHULLIN.

This house was built of the local whinstone, flat at the windows and external corners the angles were blunter and the harling (or rough-work) carried right round to get as great breadth



First Floor Plan

10 5 0 10 20 30 40 50
Scale of feet



Ground Floor Plan

The Prudential Assurance Company's Offices, Edinburgh.—Plans

of effect as possible, and also to save the expense of hewn stone, which was not procurable in the district. The roofs were covered with Easdale slates.

At the corner of the courtyard is a stable for a pair of ponies. The works were completed in

June, and the house is now occupied as a shooting-lodge.

ELLARY.

This house was erected about twenty-five years ago from the designs of the late David Bryce. Eighteen months ago it was completely gutted by

fire. Some of the external walls were shaken, and had to come down.

The house has now been reconstructed with fireproof floors, and the works are nearing completion.

The entrance-tower and billiard-room are additions; the hall is being panelled in oak up to the ceiling, and the main stair is also finished in oak. Messrs. Milligan, of Ayr, are the builders.

NEW MANSE, WEST WEMYSS.

This manse is to be erected by Mr. Wemyss, of Wemyss, as the house presently occupied by the minister is to be used for another purpose. The house was designed in the manner that was once traditional in the Fife Coast towns. The local materials will be used, and the roofs covered with the thick Forfarshire grey slate, with a stone ridge.

THE "GRANGE," NORTH BERWICK.

This house was erected last year as a summer-house for Lord Traynor. The walls were of the local whinstone, harled, with cement harling and cream-washed, and the roofs covered with red tiles. The drawing-room was placed on the upper floor (in order to get the full benefit of the very fine views); the room has a high coved ceiling.

Stables and a walled garden, with angle-pavilions, were also carried out.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

THE VYNE, HAMPSHIRE.

A VERY small party of members of the Architectural Association went, on Saturday, the 14th, under the leadership of Mr. F. R. Farrow, to Basingstoke, for a visit to The Vyne. The party were met by Dr. Andrews, of Basingstoke, the local Secretary of the Hampshire Field Club, whose explanations of the topography and folk-lore of the district made very pleasant the three-mile walk from Basingstoke to The Vyne, which is in the parish of Sherborne St. John. Between Basingstoke and Sherborne one passes from the downland of the Chalk to the woodland of the Tertiary clay, and the transition is very marked and sharp. Dr. Andrews pointed out to the party the marks of habitation of the downs by the Britons and prehistoric men, and the absence of the dwellings of these early races in the woodland.

The Vyne has been supposed by some to derive its name from *Vindomis* of the Romans, and to be the spot of the first culture of the vine in this country in the reign of the Emperor Probus, but it is tolerably certain, from the data given in the itineraries of Antonine that, wherever *Vindomis* may have been, it could not have been at The Vyne, which, indeed, lies some distance off the Roman road from Winchester to Silchester.

The house now standing at The Vyne was erected in the reign of Henry VIII. by William, Lord Sandys, who died in 1542, at which time he was Lord Chamberlain of the king's household. Considerable alterations in the appearance of the house have been made since the time of the builder, principally by Chaloner Chute, Speaker of the House of Commons in Richard Cromwell's parliament, who bought the estate in 1654, and for whom, John Webb, nephew and son-in-law of Inigo Jones, added a portico on the garden-front, prior to his patron's death in 1659.

The other principal alterations were made by John Chute, the friend of Gray and Horace Walpole, who came into possession of the property in 1754, and died in 1776. John Chute filled up the old hall with a fine colonnaded staircase, evidently inspired by Italian examples he had seen on the "grand tour," further evidences of which are to be found in numerous antique busts and marble tablets, bearing Greek and Roman inscriptions of varied character. He also commenced the tomb-room or mausoleum adjoining the chapel, and containing a fine effigy and monument of the Speaker, Chaloner Chute. Some rather remarkable majolica tiles, said to have been brought from Urbino, and now laid round the floor of the chapel, are also probably some of the spoils which John Chute brought home.

The parts of the house which remain most nearly as the original builder left them are the long gallery and the chapel. The former is wainscotted with some remarkably fine linen panels and carvings of the arms, cyphers, and devices of many of his neighbours and friends at the Court of Henry VIII. Amongst others, the arms of Sandys, Powlett, St. John, Bishop Fox of Winchester, Archbishop Warham, Foster of

Aldermaston, Bray, and Hungerford, may be seen. Unfortunately, the panelling has been grained imitation oak and varnished, which somewhat detracts from the beauty of a very charming room. The chapel contains some very remarkable carving in the poppy-heads of the stalls, and a beautiful window, said to have been brought from Boulogne by William, Lord Sandys, in 1532. As the figures of Francis I. and his two wives form part of the subjects, the glass must be nearly contemporary with the house.

There are several pictures of interest in the house, amongst others a portrait of the Speaker Chute by Vanduyck, and portraits of Henry VIII.; Charles Brandon, Duke of Suffolk, Sir Francis Bacon, and a beautiful picture of a Nun of the old family of Cufauds.

The chimney pieces are of various dates, some excellently carved oak, others of marble, but all worthy of notice. Several lock plates, bearing the initials W. S., are of capital design and workmanship, and resemble one to be found in the chapel of the Holy Ghost, at Basingstoke.

WEST HAM TECHNICAL INSTITUTE COMPETITION.

THE Technical Instruction Committee of the Council of the County Borough of West Ham have received the following report from Mr. J. Macvicar Anderson, F.R.I.B.A., with regard to the designs submitted in the above competitions:—

"6, Stratton-street, W., August 6, 1895.

To the Council of the County Borough of West Ham.

GENTLEMEN.—Having very carefully examined each one of the seventy-three sets of designs that have been submitted in competition for the Technical Institute and Public Library which it is proposed to erect on the site in Romford-road known as The Green, I beg leave to report that having regard to—

(a) The conditions of the competition;

(b) The by-laws of the borough, which, by the conditions, had to be complied with;

(c) The general merit in design, more particularly excellence of plan, to which the attention of competitors was specially directed;

(d) The adaptability of the designs for the intended purpose of the buildings.

I award—
The first place to the design marked No. 34.
The second place to the design marked No. 51.
The third place to the design marked No. 22.

I have the honour to be, Gentlemen, your obedient servant.

(Signed) J. MACVICAR ANDERSON.

The authors of the designs were found to be—
No. 34.—Messrs. J. S. Gibson, A.R.I.B.A., and S. B. Russell, A.R.I.B.A., 11, Gray's Inn-square, W.C.

No. 51.—Messrs. Clark & Hutchinson, 28, John-street, Bedford-row, W.C.

No. 22.—Mr. Thomas Davison, A.R.I.B.A., 11, Oakley-crescent, Chelsea, S.W.

The Council have, in accordance with the conditions of the competition, awarded the premiums of 250*l.*, 150*l.*, and 100*l.* respectively, to the three designs above named.

The drawings are on view from Saturday, the 21st, till this day (Saturday), at the Public Hall, Barking-road, Canning Town, E. (close to Canning Town station on the Great Eastern Railway), from 10 a.m. to 6 p.m.

ARCHITECTURAL SOCIETIES.

CARLISLE ARCHITECTURAL SOCIETY.—The annual general meeting of this Society was held on Wednesday, the 18th inst., in the committee-room at the Town Hall, when the annual report and balance-sheet were read. The other business of the meeting consisted in the election of officers. Mr. F. J. Nickols was elected President; Mr. A. W. Johnston and Mr. P. F. Ruthven, Vice-Presidents; Mr. S. W. B. Jack, Mr. W. Pogson, and Mr. J. Slack, Members of Committee; and Mr. E. B. Newton, Hon. Sec. and Hon. Treasurer. The opening address will be delivered by the President on October 29, 1895.

NORTHERN ARCHITECTURAL ASSOCIATION.—Several members of this Association assembled at Wallsend on Saturday last, the 21st inst., to inspect the new buildings and plant erected at the shipbuilding yards of Messrs. C. S. Swan & Hunter. Mr. Hunter explained that these yards occupied an area of about twenty-three acres, and in each yard there were three building slips capable of building steamers of the largest size. During the last four years a great many additions had been and were being made, including a new joiners' shop, 184 ft. by 80 ft.; smiths' shop, 140 ft. by 80 ft., fitting shop; electric power house, two additional boilers of the Babcock-

Wilcox water-tube type, electric plant consisting of three powerful dynamos, driven by a compound Robey engine, four powerful electric cranes, electric machine motors for out-lying machines, and an installation of arc and incandescent lights. The electric installation was on the continuous current system, working at 110 volts, and at present provided for about 200 brake horse-power in addition to the lighting. The electric cranes consisted of two revolving travellers working overhead, each capable of running the full length of the ship's berths, each capable of lifting three tons and travelling at a speed of 300 ft. per minute; a cantilever crane, working on the top of the roof, to lift the same weights at a similar speed, and with a span of 65 ft., also an electric jib crane for racking plates up to three tons weight on the ground level. The generating plant and the two first-mentioned cranes and the machine motors were by Messrs. Clarke, Chapman, & Co., of Gateshead. The two latter cranes were by Messrs. Thomas Broadbent & Sons, Huddersfield. The firm had greatly extended their use of hydraulic power for various purposes. It was intended to hydraulic rivet beam ends, stringer plates and bars, keel plates, intercostal plates, &c., as well as the usual hydraulic frame rivetting. The most novel features in the yard were the steel sheds, under which it is intended to build steamers of the largest class, and from the roof of which the electric cranes are worked. The new sheds are 68 ft. broad, clear of the standards, 80 ft. high in the clear, and at present 450 ft. long, but are intended to be made 600 ft. long as soon as that length is required to deal with the increased lengths of steamships which are now being adopted. The principal features of the structure have been designed by Mr. F. Caws, of Sunderland.

COMPETITIONS.

ALTERATIONS TO MUNICIPAL BUILDINGS, ABERDEEN.—In connexion with the proposed reconstruction of these buildings, the difficulty formerly alluded to has been considered by the Town Council's Finance Committee. The Borough Surveyor reported that, while, in order to meet the requirements of the different departments a floor space of 25,000 square ft. would be necessary, he found on measurement that only about 20,000 were available on the first and second floors. The Committee resolved to appoint a professional arbitrator to lay down the conditions of competition and decide on the plans.

Correspondence.

To the Editor of THE BUILDER.

A BUILDERS' CLERKS' ASSOCIATION.

SIR,—Referring to the suggestion made in the current number of your journal as to the establishment of an institution for the benefit of builders' clerks, may I be permitted to remind your readers that such an Institution is already in existence, and has had an active career, if I may so put it, for nearly thirty years.

Almost all the leading builders of London have been its Presidents from year to year, and it might fairly be thought that the Institution is well known at any rate, it is well known to those who want relief.

Its objects are to grant pensions of 25*l.* per annum to clerks who are past work or incapacitated, and of 20*l.* per annum to widows, also to provide board and education for their orphans; and further it makes grants as temporary reliefs to clerks in cases of urgent distress.

All particulars may be obtained on applying to me at the offices of the "Builders' Clerks' Benevolent Institution," 21, New Bridge-street, Blackfriars, E.C.

If you will kindly insert this in your next issue I shall be greatly obliged.

H. J. WHEATLEY,
Secretary.

** We are very glad to print Mr. Wheatley's letter to correct a possible misapprehension, but we take it that our correspondent did not refer to a provident society for Builders' Clerks, but to a society for mutual improvement and support, and for keeping up the status of their calling, which is no quite the same thing as a provident or benevolent society.—ED.

CHANGE OF ADDRESS.—Messrs. T. A. Lumley & Co., land agents and auctioneers, have removed from 35, St. James's-street, to "Lumley House," No. 34 in the same street.

The Student's Column.

METALS USED IN BUILDING.—XIII.

COMMON PHYSICAL PROPERTIES.

It is not essential that substances shall be melted to form alloys; they may be produced by the application of pressure, and it has been shown that although the compression is accompanied by the evolution of heat, the heat is not sufficient to melt the substance to be united, but that the union is effected much below the melting-point of the metals concerned. From a physical standpoint, such a phenomenon is pregnant with interest, and although its practical applications must be somewhat limited, from circumstances immediately to be referred to, it may well be enquired whether in certain cases such properties may not assist us to understand the deterioration by molecular alteration which in the end produces what is commonly called "faigue."

To fully appreciate the foregoing it is desirable to state a few of the more important facts concerning fusion. Experiment has demonstrated* that the fusion of bodies is governed by the two following laws:—

I.—Every substance begins to fuse at a certain temperature, which is invariable for each substance, if the pressure be constant.

II.—Whatever be the intensity of the source of heat, from the moment fusion begins, the temperature of the body ceases to rise, and remains constant until the fusion is complete.

Under normal conditions the following are the melting-points of divers common metals, &c., expressed in degrees Centigrade:—

Melting-points of Metals and Substances used in Alloys.

Deg.	Deg.
Mercury..... - 38°8	Antimony..... 450
Phosphorus..... + 44	Arsenic..... 500
Potassium..... 55	Magnesium..... 750
Sodium..... 90	Aluminium..... 850
Sulphur..... 114	Silver..... 954
Tin..... 228	Gold..... 1,035
Bismuth..... 246	Copper..... 1,054
Cadmium..... 321	Iron..... 1,500
Zinc..... 335	Platinum..... 1,775
Lead..... 422	

Certain substances are said to be refractory, that is, incapable of being fused. As a matter of fact, however, we have no right to regard them in that light, since the circumstance that we cannot melt them arises from the imperfection of our methods for causing fusion. Every year sees improvements in that connexion, and since the employment of the electric furnace the vast majority of so-called infusible substances have had to succumb to its influence. At the same time, it is doubtful whether we are altogether justified in abolishing the term "refractory," and it is convenient to retain it for substances that are exceedingly difficult of fusion. Foremost amongst these are the divers kinds of fire-clay, from which fire-bricks, common crucibles, and the linings of many furnaces are made. The kind of refractory material used in any particular case depends on the nature of the operation to be performed. Pure quartzose sand is a highly refractory substance, and it is used either alone as a lining for the beds of reverberatory furnaces, or mixed with fire-clay. Alumina is equally infusible, but possesses the additional advantage of not combining with bases, except in rare instances. Even where it does combine, and the lining is thereby injured, the aluminates are not so fusible as the silicates formed when quartzose matter is used. The infusible properties possessed by lime and magnesia are utilised, to some extent, in furnaces for the manufacture of steel. These substances are very basic, and naturally form fusible compounds with acids, such as are usually found in many ores. The blocks for lining furnaces, made from lime and magnesia, are termed basic bricks. Fire-clay is a natural substance compounded, for the most part, of the minerals and other matters just alluded to. It is a hydrated silicate of alumina containing lime, magnesia, iron, &c., but these latter must not be present in sufficient proportions to cause them to assume fusing properties. In addition to vessels made of fire-clay, the metallurgist uses crucibles of platinum and other bodies.

Certain substances pass from the solid to the liquid state without showing any definite melting-point; iron, for example, becomes gradually softer and softer when heated, and passes by im-

perceptible gradations from a solid to a liquid. This intermediate condition is called "vitreous fusion," and the melting-point is calculated from the lowest temperature at which perceptible softening occurs.

To return to the subject referred to at the commencement of this article, it may be noted that Lord Kelvin and others have deduced from the mechanical theory of heat that with an increased pressure the melting-point of a body must be raised. All bodies which expand on passing from the solid to the liquid condition have to perform external work in doing so, but under ordinary circumstances the amount of this work is so small that it may be neglected. If the external pressure be increased, however, the power of overcoming it can only be obtained by an increase of active work on the part of the molecules. This may be brought about by the temperature of fusion being increased. To accomplish union between two substances through the medium of pressure, it follows that on the pressure being applied the point of fusion is increased in proportion to the amount of pressure exerted, so that although a considerable amount of heat is generated in the substance compressed, by the process, the melting-point being increased *pro rata*, the time would never arrive when by the mere act of compression the substance could be melted. It is conceivable that a metal could thus be raised far above its point of fusion, and yet remain in the solid state. If the pressure were removed very slowly the substance compressed might return to normal atmospheric conditions without having been melted. If, on the other hand, the pressure were suddenly removed, the substance would tend to flash into a molten state.

The question presented in uniting two substances so as to form a metallic alloy by pressure is whether the union is brought about by the substances being melted (1) during the act of compression by the heat generated; or (2) after the pressure is more or less suddenly removed; or whether the alloy is formed by (3) a purely mechanical means by being rendered intimately compact by the mere act of compression. We do not see how the union could physically be formed by the first process alluded to, but both the others may possibly do the work, though we have slightly anticipated by stating that "the union is effected much below the melting-point of the metals concerned"—thereby implying that fusion does not take place. We know that the point is a disputable one, but we are fortified in our position by the results of the researches of more than one Continental metallurgist.

The union of substances by pressure has been investigated in great detail by Professor Spring, of Liege, and the results obtained are admirably summarised by Mr. Hiorms, of Birmingham.† He produced alloys by strongly compressing powders of the constituent metals. The powders were placed under a short cylinder of steel in the cavity of a steel block divided vertically, held together by a collar, and placed in a chamber made of gun-metal, which may be rendered vacuum. The pressure was applied to a cylindrical rod passing through a stuffing-box. Under a pressure of about 2,000 atmospheres lead filings were made into a solid block, and at 5,000 the metal was made to flow readily, like a liquid. The following table shows the amount of compression required to unite the powders of the respective metals mentioned:—

Union of Metallic Powders by Pressure.

Lead	unites at 13 tons per square inch.
Tin	" 11 "
Zinc	" 38 "
Antimony	" 38 "
Aluminium	" 38 "
Bismuth	" 38 "
Copper	" 33 "
Lead	flows at 33 "
Tin	" 47 "

The property of metals flowing under the influence of pressure is largely taken advantage of in the industrial arts. Lead pipes, for instance, may thus be made; electric cables for certain purposes are sheathed with the same metal by this means. Although this property is important enough, in a commercial sense we think its teachings as to the composition, or structure, assumed by metal under the conditions named are of the highest practical value. This structure has been little investigated, and it is with the special object of calling attention to its importance that

we have entered so much into detail concerning the formation of alloys by pressure.

When molten metals cool, the majority (if not all) have crystal or granular aggregates formed within them. This crystalline structure may or may not be visible to the naked eye, but in any case, on its mode of development, the value of the metal for structural purposes largely depends. If we could in all cases control the formation of this structure, and especially if we could direct the orientation of the incipient crystals involved, we could vastly increase the strength and lasting properties of several metals used in building. We can do this with some metals and alloys to a certain extent, but we are yet on the threshold of the subject, and it is too early to dogmatise. Probably no property possessed by metals is being more actively investigated at the present time than that of structure, due to divers influences and under set conditions. Certainly, none of the attributes of artificial metals is more important from a practical point of view. The so-called "fibre" of metals, although it can be induced in direction in several instances, will, in future, be entirely understood and controlled. The problem of brittleness will also be solved. In the meantime we may draw the student's attention to the more salient laws that may be demonstrated to govern the crystallisation of molten matter, and it will be convenient to do so by referring to the results of experiments.

In order that the particles of a definite chemical compound may disengage themselves from other matter, and arrange themselves to form a crystal, several conditions must be fulfilled:—

a. During the process of solidification, the constituent particles must have freedom of translation towards each other, so that, under the influence of the mutual attractions, their centres may take definite relative positions.

b. Also, the constituent particles must have freedom of rotation, so that under the influence of the mutual attractions, their similar parts may take definite orientations.

c. The requisite length of time must be allowed for the completion of these operations.

In order that a crystal may continue to grow, it must be enveloped in or be sufficiently near to particles of appropriate material which are situated in the conditions enumerated above in paragraphs a and b; these particles must be allowed sufficient time to reach the crystal and to fall into position, and they must be of such a nature as that they can pass to the solid state. All these conditions must be fulfilled when a substance is fused and permitted to *slowly* cool to a temperature below that of solidification, if a thoroughly crystalline structure is to be set up therein. But if the substance be suffered to cool *rapidly*, certain of the requisite conditions are absent. *Inter alia* a sufficient amount of time is not allowed. The result is that the bulk of the molten material assumes an amorphous aspect, with, perhaps, a number of crystallites, skeleton crystals, or incipient crystals—all of them microscopic in size—developed throughout. The student will readily understand that such a material cannot possess the same physical attributes as the same substance would do had it (if possible) been cooled in such a manner as that a really crystalline structure had been developed.

Professors Bloxam and Huntington, in their work on "Metals" (p. 155), remark that the more gradually molten cast-iron is allowed to cool the larger will be the crystalline structure developed on solidification, from which it follows that the metal near the surface of a casting will be much finer in grain than that at the centre. In large castings, where, owing to the thickness and the mass of metal, the centre must of necessity cool slowly, the effect of the difference in the crystalline structure is of considerable importance, as it materially affects the strength of the casting. We cannot, however, altogether endorse the same authors' statement that "when any substance crystallises, the crystallisation always takes place at right-angles to the surfaces at which cooling, or heating, takes place; in other words, the crystals will be formed so that their principal axes will be at right-angles to the surfaces bounding the mass." This is perfectly true with iron and a few other metals, but it does not hold good for every substance. The practical importance of the matter may be illustrated by the following remarks. If a square bar be cast and cooled uniformly in all directions, there will, according to the foregoing rule, be regions in which the long crystals springing from adjacent sides will meet. The line of junction must of necessity be a line of weakness. If, on the other

* Atkinson, "Ganot's Physics," fourteenth edition (1893), p. 318.

* "Bull. l'Acad. de Belgique," 2^e series, vol. XLV. (1878); *id.* vol. XLIX. (1880); "Bull. Soc. Chim.," Paris, vol. XLII. (1884).

† "Mixed Metals," 1890, pp. 72-74.

hand, the bar be cast round, using the same metal, the prismatic crystals springing from the sides meet together in the centre, and no line of special weakness results. The structure of certain metals is materially modified on their being passed between rollers, or drawn out, but we will not enter into that at present.

The process of fusing metals causes them to assume different colours in the furnace, which property has been used to determine the degree of temperature arrived at in successive stages of the operation. Pouillet has devised the following scheme:—

Incipient red heat corresponds to 525° C.	
Dull red	700
Incipient cherry red	800
Cherry red	900
Clear cherry red	1,000
Deep Orange	1,100
Clear Orange	1,200
White	1,300
Bright White	1,400
Dazzling White	1,500

The temperature calculated by this means is of necessity very approximate; the pyrometer must be employed to obtain more accurate results.

Alloys are generally more fusible than any of the metals of which they are composed; for example, an alloy of five parts tin to one of lead, fuses at 194° C. Steel melts at a lower temperature than iron, though it contains carbon, which latter is highly refractory. An application of this property is met with in the case of fluxes, substances which, when added to an ore, help the reduction of the ore to the metallic state, and promote the agglomeration of the individual particles with the formation of a mass of metal, or regulus.

GENERAL BUILDING NEWS.

NEW CHURCH, EAST LAYTON, YORKS.—On Thursday, September 19, this church was opened, the dedication ceremony being performed by the Bishop of Richmond. The general style is Late Tudor, with elaborate mouldings and other details in the style of King's College Chapel, Cambridge, and Henry VII. Chapel, Westminster Abbey. The east gable end contains a five-light window, and the west a four-light. The tower is furnished with a three-light window on each face, with octagon buttresses at the angles, surmounted by ogee-headed canopies. All the windows have richly-moulded jambs, arches, mullions, and tracery, and the doorways correspond. Internally the walls are lined with finely-dressed stone, the windows and doors having small pillars in the moulded jambs. The four piers and arches of the tower are also deeply moulded. Mr. Ebner, of London, supplied the marble mosaic for the floor; Messrs. Hart, Peard, & Co., Birmingham, the ironwork; and Messrs. Richardson & Co., Darlington, the heating apparatus. The stone used for the neighbouring Forcett quarry, and the roof is covered with brown Welsh tiles. Mr. Dodds, of Gilling, was mason, and acted as clerk of works, the architect being Mr. J. P. Pritchett, of Darlington.

NEW ACADEMY, DUMFRIES, N.B.—The school board of Dumfries have undertaken the erection of a new academy, the accepted estimates for which amount to about 12,000*l.*, and the foundation-stone was laid on Saturday, the 21st inst. The contractors for the masonry and joinery work are Messrs. Houston & Robinson, and Mr. M'Lachlan, respectively. The architect is Mr. Frank Carruthers, of Dumfries and Lockerbie.

ST. MARK'S CHURCH, JARROW.—The church recently erected in Salems-street, Jarrow, was opened on the 21st inst. It has been designed to accommodate 300 persons, including choir, the nave seating 276 and the chancel 24. The style is Late Gothic, the doors and windows being of simple character. The nave and chancel are divided by a four-centred arch in stone. The vestries on the north side comprise a room on the ground floor for the choir, with a clergy vestry over. The materials employed are Hebburn stone, the roofs, which are of open timber on the inside, being covered on the exterior with green Westmorland slates. The heating is by hot water on the low-pressure system, fitted by Messrs. Walker & Son, of Newcastle. The windows have been glazed by the Gateshead Stained Glass Company. The general contractor was Mr. Stewart Craig, of Jarrow, the contract price for the work being 2,000*l.*, and the total cost of the building will be about 2,500*l.* The architects were Messrs. Armstrong & Knowles, of Newcastle-on-Tyne.

FREE CHURCH, MUTHILL, N.B.—On Saturday last, the 21st inst., the memorial stone of the Free Church in course of erection at Muthill, Perthshire, was laid by Mr. Samuel Smith, M.P. The edifice is described by the *Scotsman* as French Gothic in style. The principal front is towards Drummond-street, and shows a large buttressed gable with a traceried window and central arched and recessed doorway. On either side of the latter, are double-

arched windows to the vestibule and cloak-room. A tower is placed at the west corner in a line with the front gable of the church, having a battlement course at the top of the masonry, and finished with a slated spire. A gallery is arranged over the vestibule, and sittings have been provided in the church for from 400 to 500 persons. A hall is arranged at the south end. The plans are by Mr. G. T. Ewing, architect, Cneph, and the total cost is expected to be about 2,000*l.*

SCHOOL BUILDINGS, GLOUCESTER.—Large schools have recently been erected in the Linden-road, for the Gloucester School Board, and were opened on the 16th inst. A special feature in the buildings is the system of ventilation adopted, which may be described as follows:—The buildings as a whole will be warmed by a low-pressure hot-water service with coils and radiators in the several rooms and corridors. The ventilation of the class-rooms, cloak-rooms, &c., will be effected by inlets for external fresh air at the backs of the hot-water coils, and foul-air flues, carried underground to the base of the ventilating tower. The latter is 3 ft. 6 in. square inside, and within this is a cast-iron smoke-flue 15 in. diameter, to convey the smoke from the hot-water boiler to the top of the tower, whilst the heat of the smoke-flue will form a vacuum to draw the foul air to the louvred openings near the top of the tower. For summer ventilation a small stove is provided to warm the smoke-flue for the same purpose. This work was carried out by Messrs. Haden & Son, of Trowbridge. The central hall and infants' department are ventilated by similar inlets to those just described, with Boyle's air-pump roof ventilators. The buildings are constructed of Severn-side bricks used externally with pressed bricks, and terra-cotta from the Wilderness works, near Mitcheldean, whilst the roof of the central hall, infants' department, and front buildings are covered with Brosely tiles. The builders were Messrs. Gurney Brothers, of Gloucester, and the architect Mr. M. H. Medland.

NEW CHURCH, GLASGOW.—The memorial-stone of the building to be known as Langside Free Church was laid on Saturday last, the 21st inst. In reality it is to comprise a vestry, sessions-house, a ladies' parlour, kitchen, a large class room, and a public-hall, besides the church accommodation. The *Scotsman* states that it is to cost 10,000*l.*, and is designed in the Greco-Roman style, with modern adaptations. The main entrance to the church has a massive doorway divided into three compartments by pilasters and impost, over which is a moulded cornice. Surmounting the entrance is an Ionic portico, composed of six columns supporting an entablature and pediment of a simple character. Ascending a flight of broad steps, balanced with die walls and pedestals for ornamental lamps, the main entrance gives access to the vestibule, which is lighted from the roof under the portico. On either side are circular staircases leading to the galleries. The sittings are planned like an amphitheatre, the pews radiating from a centre and the floor sloped all round. The organ recess is situated behind the pulpit-platform, and in front of the latter accommodation is provided for the choir. The architect is Mr. Alexander Skirving.

PRIMITIVE METHODIST CHAPEL, LEEDS.—A chapel recently erected in Cardigan-road, Leeds, was opened last week. It is built in the thirteenth-century English Gothic style, of Burley pitch-faced stone with Horsforth stone dressings, covered with Bangor slates; the windows are glazed with cathedral glass in leaded lights. The nave is divided from the vestry by stone arching, and the roof covering both are open-timbered and boarded. The minister's vestry, heating chamber, &c., are under the choir in the apse at the south end. The chapel is ventilated by numerous inlets, the foul air being extracted by a large slated wood ventilator on the ridge of the nave roof. The cost of the whole was about 2,000*l.* The principal contractors were Messrs. G. Nettleton & Sons, masons, Roundhay; Messrs. H. Atkinson & Sons, joiners, Carlton-hill; Mr. J. Season, slater, Hunslet New-road; and Mr. W. J. Haddock, plasterer, Harbills-road. The architects were Messrs. Howdill & Howdill, of Albion-street, Leeds.

CONCERT HALL, BLACKHEATH.—This hall, which is being erected by the Blackheath Concert Hall Company, is rapidly approaching completion, and will, it is anticipated, be opened in the course of next month. The exterior of the building is decorated with Gesso Duro work executed by Mr. Scale, sculptor, and is faced with pressed bricks and terra-cotta dressings. There are two approaches, the passing through the main entrance, as a concert hall, on either side of which are the secretary's office and other rooms. The main hall itself, which from the lower end to the proscenium arch is 94 ft. in length and 58 ft. in width, is a lofty building, well lighted and ventilated, and provided with seven exits, in compliance with the regulations of the London County Council. The floor is constructed for dancing, and is tongued and grooved on concrete, and the roof is panelled with elaborate Goloach moulding. The stage, which is 29 ft. in depth, and has a drop of one in fifteen, is specially adapted for operatic and orchestral work. For recitals and entertainments of a like character a removable platform will be affixed, which will have the effect of leveling

up the stage. The main hall will accommodate 1,000 persons, and over 200 can find seating-room on the stage. Ample exits in case of fire are provided by seven doors in the main hall. The whole building will be warmed by a powerful heating apparatus. The artists' rooms are immediately under the stage. Turning from the main hall there is on the same floor a smaller room for meetings, &c. Upstairs is a small hall, laid with a dancing and fireproof floor, which will be provided with a movable stage, 20 ft. by 10 ft. This room, which is said to hold upwards of 300 people, is built for minor entertainments. At the left side of the main hall it has been decided to erect, early in the new year, a building for the sole use of the Blackheath Conservatoire of Music. Mr. J. O. Richardson, of Peckham, is the builder, and the architects are Messrs. Edmeston & Gabriel.

ASYLUM, HAWKHEAD, GOVAN, N.B.—On the 18th inst. the asylum buildings recently erected for the Govan district at Hawkhead were opened. The whole scheme, however, is not yet complete. The asylum proper is practically finished, but the hospital and other buildings are in course of erection; it is anticipated that these latter will be completed in about eighteen months. The *Glasgow Herald* states that the asylum consists of four blocks, two of which will accommodate 140 male and 140 female patients. Dining-rooms, the male and female patients' blocks is a series of buildings, comprising the administrative department, consisting of dining-hall, kitchen, attendants' dining-rooms, &c., and general store on the ground floor; and on the upper floor a spacious recreation-hall, with large stage and property-rooms. Immediately in front of the general store is an official block. East of the asylum the hospital, which will have accommodation for 144 patients, is situated, and will comprise blocks for the treatment of recent and acute cases, infectious diseases, and sick and infirm cases respectively. Separating the portions for the male and female patients respectively is a central building, comprising entrance hall, waiting-rooms, observation department, offices, and surgery, with administrative offices behind, and a large dining-hall for the use of the patients. Some distance from the wing for females are the laundries, whilst the workshops will be close to the side for males. The house of the medical superintendent close by is estimated to cost about 2,000*l.* East of the workshops are the farm buildings, with a house attached, which contains additional room for seven patients, with day-room and dormitory. The present buildings will have accommodation for 431 patients, but provision has been made for future extensions, which will enable the number to be increased to 767. The heating of the whole establishment will be by steam on the low-pressure system. Particular attention has been paid to the ventilation. The total cost of the asylum is estimated at 141,611*l.* The architect is Mr. Malcolm Stark, of St. Vincent-street, Glasgow.

ROMAN CATHOLIC CHURCH, BALSALL HEATH, BIRMINGHAM.—The foundation-stone of the new Roman Catholic Church of St. John the Evangelist, which is being erected in Forge-street, Balsall Heath, was laid on the 18th inst. The building is designed in the Early English style. The contractors are Messrs. Harley & Sons, and the estimated cost is 3,500*l.* Mr. A. H. Vicars, Strand, London, is the architect.

UPTON ASYLUM, CHESHIRE.—At a recent meeting of the Cheshire County Council, a proposition for the extension of the asylum was discussed. The committee appointed to investigate the matter had directed the attention of the architects to ascertain whether any reduction could be made in the estimates, and the effect was a considerable reduction, amounting for the present to 9,050*l.*, which reduced the builder's tender from 79,500*l.* to 70,441*l.* Alluding to the discrepancy in the architect's estimates for the work and the lowest tender sent in by Messrs. Jones & Son, of Liverpool, some time ago, the Chairman said that Messrs. Grayson & Ould, the architects, of Liverpool, had submitted their list of reductions as follows:—Reduce size of water-tower, 1,800*l.*; common bricks in lieu of Rulon wire-cut facing-bricks, 829*l.*; cost of glazed bricks between first and second floors, 1,200*l.*; bakery, less fittings, 171*l.*; saving in grates and chimney-pieces, 504*l.*; sundries, 407*l.*; less cost of fireproof flooring, wood-block paving, &c., 1,560*l.*; portion of provision of brickwork, 500*l.*; brick coping to flats, brick cornices to chimneys in lieu of stone and less stone-work administrative block, carving, &c., 1,000*l.*; cost of quality, 320*l.*; locks to windows and less cost of ironmongery, 414*l.*; dado framing, ornamental ceiling committee-room, dado rail, &c., corridors and dining-room, and covering main pipes with non-conducting material, 657*l.*; less cost of baths, 200*l.*; less cost of heating and ventilation, 1,033*l.*—total, 9,050*l.* The architects stated that, as they had had an opportunity of examining Messrs. Jones & Son's priced quantities, they were in a position to state positively that the rise in wages, which had taken place within the last two years, together with the probabilities of a further increase during the progress of the contract, largely accounted for the difference between their tender and the original estimate.

SANITARY AND ENGINEERING NEWS.

CHEDDINGTON SEWERAGE.—The Linslade Rural District Council has appointed Mr. H. Bertram Nichols, C.E. of Birmingham, to prepare a report on the sewerage and sewage disposal of the parish of Cheddington.

WATER SUPPLY, MALVERN LINK.—The Link District Council have at length decided to adopt the scheme of Mr. Baldwin Latham, C.E., for supplying the neighbourhood with water. At a public meeting held last week it was resolved that a Bill be presented in the ensuing session to extend the district of the Malvern Link Urban District Council so as to include a portion of the Parish of Cradley, in the County of Hereford, and for the construction and maintenance of works for the supply of water within the Malvern Link Urban District, and within such other parishes and places as may be prescribed by the Bill, and for other purposes. Briefly, the Engineer's scheme comprises the construction of a reservoir at West Malvern (which is in the Link district) in a natural basin into which the water from rainfall and springs on the west side of the Malvern Hills will be drained by means of catch-water drains, &c., and the supply given to the Link Urban District by gravitation. The portion of Cradley to be taken into the district lies between two portions of the Link district. The proposed reservoir is to hold thirty million gallons—giving a supply of twenty gallons per head for a period of 200 days. The estimated cost for the construction of the works, contingencies, land, Parliamentary and other expenses, is 36,095*l*.

SEWERAGE WORKS, KING'S NORTON.—The inauguration of the system of sewerage works which have been in hand for several years past at Lifford, near King's Norton, took place on Tuesday last, the 24th inst. The *Birmingham Daily Gazette* says that, in reviewing the history of the undertaking the chairman of the Rural District Council remarked that, to convey the sewage from recently-developed portions of their district over a hilly country, the Rural Sanitary Authority decided to adopt Mr. Godfrey's plan by utilising compressed air. By this method of lifting, one set of engines actuated the sewage at any number of points, and instead of several pumping-stations scattered over the district one central station supplied all the power required. From the central station at Lifford compressed air was sent through a 3-in. main for a distance of nearly 2,000 yards to Ejector Station No. 1, in which were placed two ejectors of 100 gallons capacity. Either of these could be worked separately or together. As soon as one was full of sewage an automatic arrangement liberated the compressed air at a pressure of 40 lbs. to the square inch, and as soon as the valve opened, the sewage was lifted through a 6-in. main rising to a vertical height of 80 ft. to a manhole, from which it fell by gravitation to Ejector Station No. 2, where another pair of ejectors were placed of 150 gallons capacity. These ejectors received not only the sewage from Station No. 1, but all that which flowed by gravitation from Middleton Hall-road, Camp-lane, and the village of King's Norton. From these ejectors the sewage was discharged through an 8-in. main up a vertical lift of 30 ft. into the tanks. The ejectors would catch up 1600 gallons per minute when worked continuously, or forty gallons per head per day from a population of 21,600 persons. The village of King's Norton and Middleton Hall-road contained 1,600 persons, while on the extension area 341 houses had been approved within the last four years, making a total population of about 4,000, so that the plan put down was ample for many years to come. The crude sewage would be treated with lime, alum, &c., to precipitate the suspended matter. Then the effluent would be subjected to carbonic acid gas and a germicide to make it sterile, after which it would filter through Thwaites's filters and pass into the stream. Messrs. Hope had undertaken the treatment of the sewage. The contract for the sewers and buildings were Messrs. Currell & Lewis; for the machinery, Messrs. Hughes & Lancaster; for the boilers, Mr. E. Danks. The scheme was prepared by Mr. Godfrey, the Engineer to the Council, and the execution of the works had been in charge of Mr. J. H. Webb, Assistant-Surveyor.

THE SANITATION OF BISHOP AUCKLAND.—A Local Government Board inquiry was held at Bishop Auckland on the 24th inst., by Dr. R. Deane Sweeting on the question of the application by the County Council to the Board for the issue of an order under Section 42 of the Public Health Act, 1875, requiring the Rural District Council of Auckland to undertake the cleansing of ashpits and scavenging of several important townships in the district. Dr. Hill, the county medical officer, attended, and submitted evidence in support of the order, quoting freely from his reports to the County Council on the unsatisfactory scavenging arrangements. There was a large attendance at the inquiry, and the order was opposed in regard to many of the townships—particularly Crook and Bily-row, and places where colliery companies at present carry out their scavenging—regard to the workmen's houses. Mr. Adams, clerk to the Rural District Council, said their contention was that they had only been in office about nine months, and had scarcely had time to carry out the work they considered neces-

sary. Their medical officers supported the order, but these gentlemen did not know the necessities of the various districts so well as those living in the immediate neighbourhood who were opposed to the order. Dr. Hill, in reply, remarked that the object of the County Council in this matter was solely that of the improvement of the sanitary condition of the district, which he considered was not in a satisfactory state.

STAINED GLASS AND DECORATION.

GREATFORD CHURCH, Lincs.—A three-light window in this Parish Church has just been filled with painted glass by Messrs. Percy Bacon Brothers, of Newman-street, London, W., each light containing a single figure of St. John, St. Peter, and St. James respectively, with representations of angels in the tracery. A peculiar feature in this window, is the canopy-work of a very late character to suit the architecture of the window, which is square-headed.

WINDOW, PARISH CHURCH, WREXHAM.—The large west window of this church has recently been embellished with stained glass as a memorial to officers and men of the Royal Welsh Fusiliers who have fallen in divers battles in which the regiment has been engaged. The *Bristol Times* states that it is a fifteenth-century window and is divided into five long lights up to the springing of its arch, above which are ten smaller tracery lights in three tiers. In the upper part of the lower lights are full-size figures of St. Deniol of Bangor, St. Michael, St. David of Wales, Edward the Black Prince, and St. Giles. Beneath these, in relation to the figures above, are subsidiary subjects illustrative of the meeting of St. Deniol and St. Augustine; St. Michael with his warrior angels; the preaching of St. David; the Black Prince at the battle of Poitiers; St. Giles with the hind seeking refuge with the saint from the royal hunters. These lights are richly canopied to agree with the style of the window. In the tracery-openings are introduced twenty-four smaller figures of saints especially connected with Wales. At the apex of the window the badge of the regiment is represented. At the base of all, in gold mosaic, runs a suitable dedicatory inscription. The names of the regiment's battles, viz., Blenheim, in Egypt, in the Peninsula, Waterloo, Alma, and Lucknow are also introduced. The work is rich in detail and colour, and was designed and executed by Messrs. Clayton & Bell, of London.

FOREIGN AND COLONIAL.

FRANCE.—Owing to a serious accident which has recently taken place near the Pont de l'Europe, the company of the Chemins de Fer de l'Ouest have decided to pull down the long Batignolles tunnel. This will considerably enlarge the network of railways approaching the Gare Saint Lazare. In order to do away with the scarcity of water from which Paris so constantly suffers during the hot weather, the Municipality intend to bring the waters of the Loire into the city. There is also a scheme of making a third reservoir at Saint Cloud, of which the expense is estimated at 1,400,000 francs.—Madame Furtado-Heine has given to the French Government a very fine villa, which belongs to her at Nice, and which is to be made into a hospital for officers. M. Scala is the architect who has been entrusted with the work of altering this great house.—A competition of sketches is open, between the architects of Aisne du Nord, Pas-de-Calais, and La Somme, for the rebuilding of the Palace of Fervagnes at St. Quentin. The expense is expected to be about a million francs.—The General Council at Hérault has opened a competition for designs for a lunatic asylum at Montpellier.—An electric railway is to be made at Lyon which will connect the Croix Rousse to the Colline de Fourvière, and will require the construction of a monumental bridge over the Saône. It is estimated that five millions will be spent on this operation.—A fine bridge is being made across the Isère at Fontenex. It is of stone, with four arches, the length will be 115 metres, and the cost 160,000 francs.—The Minister of Fine Arts is about to restore the Abbey Church at Vienne (Isère), also the Basilicon of Saint Maurice, the portal of which, dating from the fifteenth century, is famous.—The tower of Cherbourg has erected a monument of granite with bronze ornaments, in honour of the soldiers and sailors who died during the expeditions to the far East.—The death is announced, at the age of seventy-two, of Anatole Montaignon, a learned archaeologist, professor of the Ecole des Chartes, and author of valuable works on Fine Arts in France.—The death is also announced of M. Henri Joseph Parent, at the age of seventy-six. He was a member of the Société Centrale, and of the Caisse de Défense Mutuelle des Architectes. He has left a considerable estate in private contemporary architecture.—There is a question of making a navigable canal from Berry; it will measure 45 kilometres, and will cost about thirteen million francs.

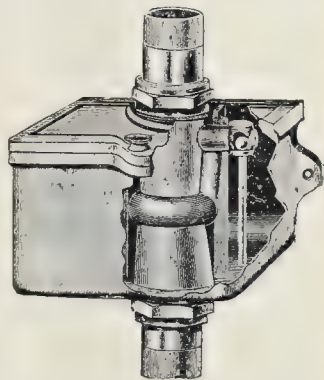
MISCELLANEOUS.

THE LATE MR. EWAN CHRISTIAN.—A monument of simple design and recumbent in form has just been placed over the grave of the late Mr. Ewan Christian, in Hampstead Cemetery. It is executed in red granite by Mr. Forsyth, and bears the following inscription:—"In reverent and loving memory of Ewan Christian, architect, September 20, 1814—February 21, 1895. With good will doing service, as to the Lord, and not to man, that I may win Christ, and be found in Him, not having my own righteousness, but that which is through faith in Christ."

RECVLVER ABBEY.—Will the writer of a letter on this subject, from Sittingbourne, kindly send us a legible signature to which we can reply.

THE LAST OF THE TURNPIKES.—Of all the turnpike trusts with which this country abounded in the last generation, there remains only one in existence. Possibly it will be a surprise to some people to hear that there is even one survivor of such an unpopular system of road government, but it will not be possible to make the assertion a week hence. The Shrewsbury and Holyhead Turnpike has for the most part been already thrown open, but the portion of the road which traverses the Island of Anglesey was continued in existence by a special Act of 1890 until November 3 of the present year. Thirty years ago there were no fewer than 1,047 turnpike trusts in England and Wales, with 20,189 miles of road supported by tolls.—*Local Government Journal*.

AUTOMATIC DISINFECTING-BOX.—Messrs. Gabriell & Co., of Birmingham, send us the illustration of their patent automatic disinfecting-box. It consists of a small iron box, with a brass tube through the centre, attached to which is a small syphon-pipe which has in the top a metal ball to regulate the supply. The box is fixed on the fall-pipe between the cistern and pan, and is filled with any liquid disinfectant. On the flushing cistern being brought into use, the action of the water flowing down the pipe through the box sets up a syphoning action, lifts the ball from its seat in the small syphon,



Gabriell's Automatic Disinfecting Box.

and draws out a small quantity of the liquid, which is carried with the water into the pan. When the flushing-cistern has ceased syphoning, the small ball in the syphon falls by its own weight on its seat, and prevents any more liquid escaping. The lid of the box is made detachable, so that it can be readily removed for filling when required. The box when filled will last two or three weeks, according to the number of times it is used. It seems the most convenient method of automatic disinfection that we have seen.

SAFETY PARAFFIN LAMP.—This lamp, patented by Messrs. Kiesow & Co. (London), is contrived to prevent the escape of oil if accidentally overturned. The reservoir is of metal (it should never be of glass), and the wick is drawn through a tube with an S bend. In case of the lamp being overturned, a portion of the bent tube fills with air and prevents the oil escaping; it acts as an "air-seal" in fact, against the flow of the oil.

A PATENT DOOR-STOP AND CATCH.—Messrs. Marrian & Co., of Birmingham, send us a specimen of what they call "The Anti-slam," a very ingenious and useful combined door-stop and catch. It is in a metal seating, fitted in flush with the floor. Above the seating is a small india-rubber-coated stop, intended to occupy the extreme point to which the door can open, and on the door striking this stop it moves back about half-an-inch, and in doing so automatically raises a steel catch on the other side of the door, which holds the latter open. In the case of doors which have to stand open often there is thus a complete security obtained against the door slamming to, by the mere action of opening it. When it is desired to release the door it is only necessary to touch the stop with the foot, and the catch is drawn down again flush with the floor. It is an ingenious device, and ought to be very useful.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Asylum Extension, Beverley	East Riding Visiting Committee	500, 250, 100.	Oct. 28
*Modern Hotel,	Weymouth Corp.	2000, 1000, and 500.	Dec. 3
Workhouse Wards, Beckett-street	Leeds Union	500, 250, 125, 100.	Jan. 196

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Pipe Sewers, &c. Ormskirk	Latham & Burnough U.D.C.	Wood & Brodie	Oct. 1
Addition to Tannery, Port-road, Carlisle	T. Williamson	Richardson, Son, & Co.	do.
Bulky House, &c. Copley Mills, Halifax	Wimborne U.D.C.	A. G. Daise	do.
Mansingup South Park road and others	Waterloo U.D.C.	Official	do.
Stone Walls, &c. at Conduley, Broadway	Commissioners	J. Riddle	Oct. 3
School, Cefnnewydd, Mountain Ash, Glam. Additions, &c. to Asylum, Emsworthy	Llanvannor School Bd. Lunacy Commissioners (Ireland)	M. Morgan	do.
Nine Houses, Crossgates, near Leeds	Blackburn Corp.	C. A. Owen	do.
Disposal Works, Salford	Belfast Water Com.	J. B. Broxley	do.
Cast-iron Pipes (4,824 tons) and Cast-iron Sewerage, Kerkling, &c. Latham avenue, Salford	Waterloo U.D.C.	G. W. Land	Oct. 3
Wholesale and Limestone	Blaydon-on-Tyne U.D.C.	L. L. Macassey	do.
Stables and Schoolroom, Glazby	Frederick Church Committee	F. B. Yates	do.
Seamings, &c. Egerton street	Frederick Church Committee	W. S. Simpson	do.
Drain Pipes	Horsham U.D.C.	Official	do.
Steady Repairs, Workhouse, &c.	St. George-in-the-East Guardians	Wilson, Son, & Aldwinkle	Oct. 4
*Foundation for Tarncliffe, Hope	M.R.C. Co.	Official	do.
Erection of Sixteen Cast-iron Guard Houses, &c. & Vernon-street, Bridlington Quay	Admiralty War Dept.	J. Earnshaw	Oct. 5
Additions to Workhouse, West End	Cowton's Charity Trust	Richardson, Son, & Co.	do.
Steel and Iron for Engineering Works	South Stanchion Union	do.	do.
Electric	Wheatley & Robinson, Ltd.	do.	do.
Three Ships, Peel-street, & Morley, York	J. Taylor & Sons	do.	do.
Trunk Press House, Buildings, &c.	Cambridge Corp.	J. T. Wood	Oct. 7
Railway Pipe Scaffolding	Penydarthen U.D.C.	do.	do.
Brick and Pipe Sewers, Morriston	Swansea Town Council	B. H. Wray	do.
Protection of House	Croydon Council	Official	do.
*Paving Works at Workhouse	Whitechapel Union	Bruce J. Capell	do.
*Broken (franchise)	Barnesbury Vestry	F. Sumner	do.
Cast-iron Pipes and Castings	Southampton Corp.	W. Mathews	Oct. 8

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
House adjoining Docks	Exmouth Dock Co.	J. Johnson	Oct. 8
*Repair of Roads and Road Materials	Croydon Council	W. Powell	do.
*Drain Pipes and Stairs	Official	do.	do.
Passenger Station, Llanvannor, Glam.	G. W. E. Co.	do.	do.
*Engine Shed, &c. Taunton	do.	do.	do.
*Broom Gravel	Edmonton U.D.C.	do.	do.
Baths and Washhouses, Springburn	Glasgow Police Com.	do.	Oct. 9
Additions to Infirmary, Strangeford, &c.	Minster	do.	do.
Additions to Schools, St. Simeon, &c.	Sheppey Union	W. L. Grant	do.
Whitstone Road Metal, near Newcastle-on-Tyne	Bedlington U.D.C.	J. Bentley	do.
Quay Wall	Pool Town Council	M. Cooper	Oct. 10
Road Works	Gosduning Corp.	S. Weir	Oct. 12
School, &c. Rhymer Bridge	Llangyfelach Sch. Bd.	D. Morgan	do.
*New Buildings at Workhouse	Leigh Union	Morgan & Littlewood	do.
*Grate Kerkling and Chauling	Barnet U.D.C.	W. H. Mansbridge	do.
*Midvale Glass Parings	do.	do.	do.
Brick and Pipe Sewers	Llandudno U.D.C.	E. P. Stephenson	Oct. 15
Alterations, &c. at Offices, Donner-platz	Edinburgh Sch. Bd.	H. Foster	do.
*Alterations to Lavatories, Eugene House, &c.	Com. of H.M. Works	J. Lee & Son	do.
Fifteen Houses, Centre Rhonda, Glam. Slaughter House, &c.	Stepney Union	G. E. Holman	Oct. 17
Sewerage Works, Portland-street	Kirkcaldy Ashfield Co-op. Soc. Ltd.	Jack Lees	Oct. 21
Shops and Houses, My Lady's-road, H.E.	Mansfield Woodhouse U.D.C.	Hall & Lamb	No date
Hai, Langley Park, Sutton, Surrey	do.	F. Cook	do.
New Road, Al. Sainte Rute, Maiden Ternes, Fitzalan-avenue, Newquay, Corn.	do.	E. & J. Byrne	do.
Additions to Villa, Orleton, near Leominster	do.	W. J. A. Soutar	do.
do.	do.	H. D. Tully	do.
do.	do.	Silvanus Trevel	do.
do.	do.	W. W. Robinson	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works	Sittingbourne U.D.C.	1200	Sept. 1
*Superintending Architect	Lancashire Standing Joint Committee	600	Oct. 1
Highway Surveyor	Ludlow R.D.C.	1000	Oct. 5
*General Outdoor Assistant	Hove U.D.C.	21 lbs. per week	No date
*Clerk of Works	Edgware Sch. Bd.	do.	do.

Those marked with an asterisk (*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv., vi., and viii. Public Appointments, pp. xvi., xvii., and xviii.

LEGAL.

PROSECUTION FOR USING BAD MORTAR.

A CASE of considerable interest, where a builder was prosecuted for failing to use proper mortar or cement in erecting some new buildings at Wolverhampton, came before the local stipendiary, on Friday the 20th inst. The builder in question was Mr. Alfred Peplow, of Bellfields, Compton-road, Wolverhampton, and the charge had reference to work done on August 6th and 20th last. The *Wolverhampton Express and Star* states that the Town Clerk, who appeared on behalf of the Corporation, said the defendant was a builder carrying on business at Wolverhampton, and he was charged that on August 6th he did, in erecting new buildings in Dawson-street, not cause the walls enclosing the same to be put up with good mortar or good cement. On the same day he was charged with an offence in respect of the cross walls. There was also an information laid against defendant for doing the same thing on August 20th. He (the Town Clerk) understood that Mr. Foster, who was for the defence, was willing to plead guilty with respect to the offence of August 9. A sample of the mortar taken was submitted to the Borough Analyst, who in his certificate stated that there was a decided trace of copper in the dry sample of sand, &c., and a slight trace in the mortar. The amount of lime was sadly inadequate to form good mortar, being one to seven, instead of about one to three of sand. There were ashes, broken brick, and some lime in another sample, which was absolutely inadequate to bind the materials for mortar. Mr. Foster asked him (the Town Clerk) to withdraw the case in respect of the second offence, and he would be willing to do so on condition that the full costs were paid, but it must be remembered that the offences were of a very serious character, and he was bound to press for a heavy penalty in the case which was admitted.

Mr. Foster, for the defendant, said it was practically one offence. In mitigation of penalty he had to say that defendant had been most anxious to use the best possible materials for the construction of his property. He was not a speculative builder, he was putting up the property for his own use. He was engaged as an insurance agent, and had not been able to devote that attention to the building he would like to have done.

The stipendiary imposed a penalty of £1. and costs in one case, and allowed the others to be withdrawn on payment of costs. Total, £12. 11s. 6d.

CAPITAL AND LABOUR.

LONDON BRICKLAYERS' DISPUTES.—The crusade on the part of the Operative Bricklayers' Society against the employment of non-union men has been vigorously pursued during the past week. Amongst other things the Society withdrew its men from the works of Messrs. Nightingale, at Orme-street, Bayswater-road. The National Free Labour Association received urgent appeals from the employers to send men to take the place of the strikers, but it was soon found that more men offered themselves than could be employed, and the works consequently proceeded as usual, though the union pickets surrounded the place. We understand that bricklayers are being offered work for the Association at the recognized trade union rate of wages. The Operative Bricklayers' Society had previously called out men from Messrs. Mowlem & Co.'s at Oak Wharf, City-road. Considerable misunderstanding arose as to the policy of the London Building Trades' Federation with reference to the strikes. It was hoped by the Operative Bricklayers' Society that the Federation would support them, but subsequent events did not altogether confirm this impression, though so many different versions of the disputes have been given that it is hard to know what to believe.

MEETINGS.

SATURDAY, SEPTEMBER 28.
Architectural Association.—Visit to Wickham Hall. Leave Cannon-street Station 2.18 p.m.

TUESDAY, OCTOBER 1.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. Herbert Marley on "Sanitary Law." 8 p.m.
Glasgow Architectural Association.—Mr. A. M. Gibbon on "Materials." 8 p.m.—Visit to Glasgow Art Galleries, Kelvingrove.

WEDNESDAY, OCTOBER 2.
Sanitary Institute.—Inspection and Demonstration of Sewage and Disinfecting Station, Marylebone. 3 p.m.
Builders' Foremen and Clerks of Works Association.—Ordinary Meeting. 8 p.m.

FRIDAY, OCTOBER 4.
Institution of Junior Engineers.—Annual General Meeting, Westminster Palace Hotel. 8 p.m.

SATURDAY, OCTOBER 5.
Sanitary Institute.—Inspection of Wimbledon Sewage Works, conducted by Mr. C. H. Cooper. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

16,585.—*SET SQUARES*: *J. Hughes*.—A set-square (50 deg.) having its edges divided into different scales of inches, and geometrical figures described upon its faces.
19,355.—*FIRE-PROOF FLOORS*: *T. Maximan*.—Refers to the lintels for fire-proof floors or roofs, such lintels being constructed of hollow fire-clay, and of a suitable shape for forming cavities for receiving the concrete covering, and also fitting into each other longitudinally for mutual support.
19,374.—*SAWS*: *W. Plett*.—Provides an easier method of sharpening. A helical tooth or worm of steel, stone, or other suitable material having a rough or file-cut edge, is arranged in a suitable frame, and by means of an axle and mitre-wheels is made to travel or rotate between the teeth of the saw.
19,711.—*KILNS*: *B. Dawson*.—Refers to kilns for pottery, bricks, and the like. For supplying hot air to any one or more of the kilns at starting, a pair of regenerators are arranged on the outside in connexion with which are a pair of reversing valves. The regenerators are heated by gas at the start, and afterwards by utilising a portion of the heat of the products of combustion escaping from the kiln.
19,712.—*GATE-HOLDER*: *J. Catter*.—A device for holding open gates or doors. A hook is attached to the door or gate, and when in use engages with a hole formed in a hinged spring actuated plate.
19,944.—*SKYLIGHTS*: *K. Hurlston*.—Relates to a skylight which will admit air, but will be weather-proof in other respects. Several roof-shaped frames are hung on to a movable skylight frame, containing the window-pane, in such a manner that, on the window being opened, gaps, for the admission of air, are formed between the frames.
19,945.—*VAULTS*: *C. Fells*.—Deals with the manufacture of fireproof vaults, walls, ceilings, &c., and consists in applying to a temporary erected boarding, a pulpy mixture formed of cluders, gypsum, lime, and glue, to which is afterwards added another layer of vegetable fibre, dipped in a mixture of gypsum and glue, for the purpose of obtaining a quick-hardening strong mass. A third layer, similar to the first, may be added.
19,951.—*DOOR CHECKS*: *E. Blount*.—A contrivance for automatically closing doors without slamming. Consists essentially of a casing having a liquid space, a piston and cylinder, and a bye-pass from the liquid space to the outer portion of the cylinder, with a valve for controlling the movement of the liquid.
19,959.—*ROOFING TILES*: *P. Burns*.—In this invention each tile consists of two plates of rhomboidal shape, arranged to overlap, and provided along the sides with grooves and ribs fitting each other, or simply with a flange projection at the top and bottom of each plate respectively.

NEW APPLICATIONS FOR LETTERS PATENT.

SEPTEMBER 9.—16,802, W. Coke, Ribbed Stoneware, Earthenware, Concrete, and other Sanitary Pipes.—16,824, W. Chivers, Window-sash Adjuster.—16,829, T. Lewis,

C.—Boundary walls, gates and railings. D.—Difference for Bath.

ILLUSTRATIONS.

The Abbeys of Great Britain.—No. 15. Romsey: from the South-East. Drawn by Mr. C. E. Mallows.....Double-Page Photo-Litho.
The Abbey Church of Romsey: Ground Plan. Measured and Drawn by Mr. C. E. Mallows.....Double-Page Photo-Litho.
Romsey Abbey: The Angle of Choir and South Transept. From a Drawing by Mr. R. Phené Spiers, F.R.I.B.A.....Double-Page Ink-Photo.
Romsey Abbey: North Transept and Choir. Interior of South Transept. Drawn by Mr. C. E. Mallows.....Two Single-Page Ink-Photos.
Selected Design for West Ham Technical Institute and Public Library: Perspective View.—Messrs. Gibson & Russell, Architects.....Double-Page Photo-Litho.

Blocks in Text.

The Churches of Norwich.—Fig. 1. Clearstory of Apse, Cathedral; Fig. 2. Remains of Chapter-house; Fig. 3. Crypt, Blackfriars; Fig. 4. North Side of Choir, St. Helen and St. Giles; Fig. 5. Hospital of St. Helen and St. Giles. Fig. 6. St. Mary's Costary; Fig. 7. St. John the Baptist (R.C.) Church.....Pages 230, 231	Selected Design for West Ham Technical Institute and Public Library: Messrs. Gibson & Russell, Architects.—Side Elevation, and Section from Back to Front.....Page 238
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The Churches of Norwich.



HERE is perhaps

no town in England which retains more marks of its Mediaeval history than Norwich. It is true that the street architecture of Chester is more interesting, but the thirty-six old churches of Norwich find no counterpart in the picturesque northern city; and not only the Norwich churches ancient, but they have escaped modernisation, and for the most part have been restored only sufficiently to hand them down to future times in a substantial condition. We do not mean to say that we exactly approve of everything in the way of church restoration which has been carried out during the last twenty years or so at Norwich, for there are certainly several things which we distinctly regret, and others which we consider very questionable. As cases in point, we will refer to the entire removal of the rich and excellent Renaissance furniture out of St. Peter's Mancroft, and the addition of canopies to the tower of that church. We are convinced that, if time had been given for consideration, and "consultations" held on these subjects, St. Peter's would still retain its Renaissance furniture, and would not have its tower disfigured by stumpy canopies. On the other hand, to give credit where it is due, the restoration of the magnificent roof is admirable, and the great architect who executed this work told us he had entirely annihilated "self" in the matter, in order to hand down to posterity this noble work of Mediaeval art. The restoration was most difficult one, as the constructive members were absolutely rotten; but by most judiciously and carefully removing every atom of the old carving and moulding, the purely constructive work was renewed in oak, and the original ornamentation attached to it, that as the architect told us, "My great object has been to make it look as though I had done nothing, though in fact I have conferred a great benefit upon future ages." It was a work of love and sacrifice, and a place where the more care, and the more consideration, and the more time spent, the more the remuneration. Yet we are often

told that we cannot turn out such work now as was executed in the Middle Ages, because "our modern architects are men of business, and not artists." If the late Mr. Street had been "a man of business," he would at once have put a new roof over St. Peter's Mancroft, which would have saved him an immense amount of trouble and responsibility, and probably doubled his "takings" over the work. Nor is this case by any means an isolated one. There are many living architects who, like the late Mr. Street, would thoroughly sacrifice their own interests to preserve what they believe to be a valuable work of art.

Norwich Cathedral may be classed as one of the noblest second-class cathedrals in England. It cannot, of course, compete with such churches as Lincoln, York, Ely, and Winchester, as its scale is so very inferior to that of these vast churches, but in one or two respects it takes a very high rank amongst our English cathedrals. Be it understood that it is by no means necessarily the largest cathedrals which make the greatest impression upon the mind—in fact, it may be questioned whether churches of moderate dimensions do not often produce the greater effect. Certainly Westminster makes a much deeper impression than York; and if one goes to Germany, the comparatively small cathedral of Ratisbon is more impressive than Cologne; St. Denis is more impressive than Notre Dame, at Paris; and, in like manner, Norwich is more impressive, internally, than most of the larger English cathedrals. What reasons can we assign for this? In the case of Norwich there are, perhaps, three special ones which might be named. In the first place, the proportion of height to width is very perfect, which is not always the case in English cathedrals. It is $2\frac{1}{2}$ to 1. At York it is only 2 to 1, which is too little for a vaulted church. At Westminster it is 3 to 1, and at Cologne nearly 4 to 1, which is excessive. Secondly, at Norwich the vaulting is all of one uniform design, and though it is Perpendicular in date and style it is remarkable how wonderfully well it harmonises with the severe Norman work of the nave, and seems to point out that contrast in style does not of necessity produce incongruity. Another singularly beautiful feature of this interior is the treatment of the apse (see fig. 1), especially of the late clearstory added to the Norman substructure. This late

addition is so admirably designed as to render the apse of Norwich Cathedral the most pleasing in England. The skilful change of arrangement from the clearstory of the choir to that of the apse is worthy of special notice, as the method of getting over the difficulty presented by the difference of width between the bays of the choir and those of the apse has resulted in a most charming treatment. Now this is just where an able architect succeeds; not in rushing into originality where no new treatment is required, but, in grappling with a difficulty in such a way as to overcome it by a novel and beautiful treatment.

Norwich Cathedral possesses the longest Norman nave, the loftiest Norman lantern, and the largest cloisters in England. A very beautiful feature of the last is a kind of outward arcade to the east, which probably formed a portion of the now destroyed chapter-house (see fig. 2), or possibly it was the west end of the chapter-house itself; which, like that of Canterbury, may have been entered from the cloisters directly without the intervention of porch or vestibule. There is a very remarkable piece of ancient ritual arrangement, also, to be seen at Norwich Cathedral. The old Norman Bishop's Throne exists in the centre bay of the apse, behind the altar, which suggests the question—Was the high altar originally arranged in the basilica manner, with its back to the people and its face to the throne, as was evidently the case at Augsburg? or were there two altars, one facing east and the other west? The difficulty is this—the bishop at Norwich faced west when sitting on his throne, whereas at Augsburg and other basilica churches he faced east. An elaborate new Bishop's Throne has been erected in the usual position, and a fine stone pulpit—both from the design of Mr. Pearson.

St. Peter's Mancroft is one of the finest parish churches in England. It consists of a great nave and aisles of nine bays, there being no architectural division marking the chancel; probably the rood-screen ran right across the nave and aisles. There are two small transeptal chapels and a noble western tower with an eastern sacristy in two stories. The piers supporting the arcade are unusually lofty, and the arches sufficiently wide to afford a good view into the aisles. Where the old arrangement of a nave and aisles is adhered to a better treatment for a vast parochial church cannot be adopted for

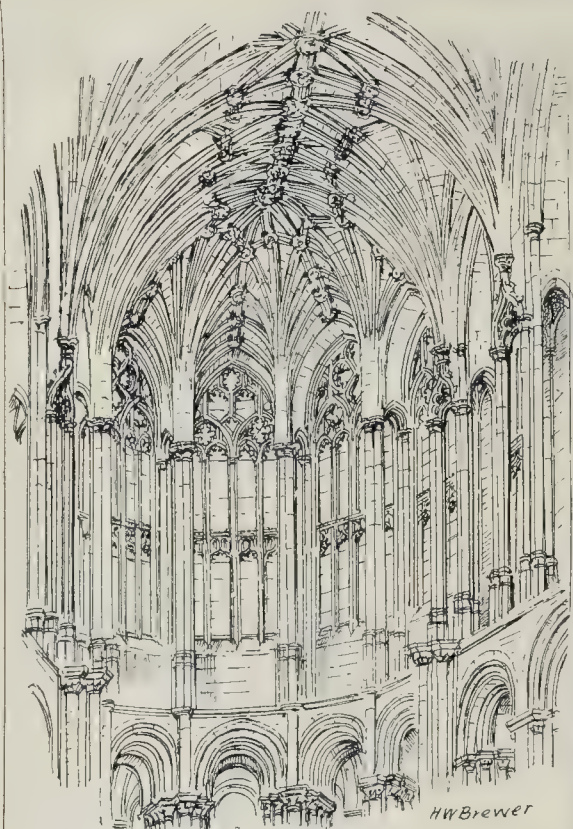


Fig. 1.—Clearstory of Apse, Cathedral.

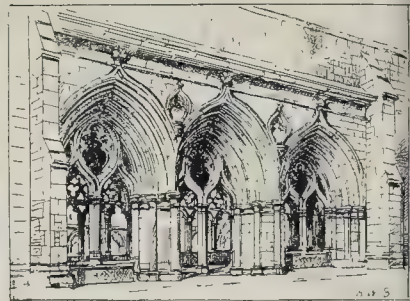


Fig. 2.—Remains of Chapter-house.

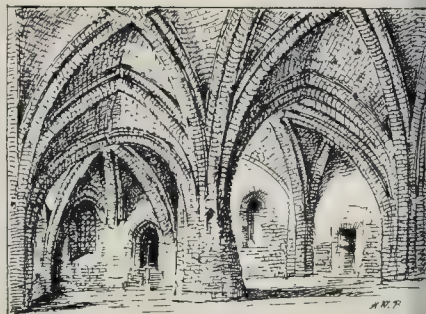


Fig. 3.—Crypt, Blackfriars.

modern requirements. The total length is about 220 ft. and the height about 60 ft.; the clearstory is continuous throughout; the lower portion of the tower forms an open porch, and there is an open passage under the altar platform—a feature which we find in St. Gregory's Church (which is a smaller edition of St. Peter's), and at Walpole-St. Peter's, in the same county. St. Stephen's is another imitation of St. Peter's Mancroft, though smaller and later in date; in fact, it would appear that this church was not completed until after the Reformation. The tower bears the date 1601, though it might well pass for work of a century earlier.

The old church of the Dominicans now forms two public halls; "St. Andrew's Hall" comprising the nave and aisles, and "The Blackfriars' Hall" the choir. Between the two is a square bay, over which, in the first edition of Dugdale's & Dods-worth's "Monasticon," a lofty octagonal tower is shown, which, however, no longer exists. The building is, for the most part, Perpendicular, though the east window of the choir and those of the south aisle of the nave have Late Decorated tracery. There is a question whether these Late Decorated windows in the Norwich churches are not of the same date as the Perpendicular ones, for we sometimes find, in alternate bays, Curvilinear and Perpendicular tracery. In Norfolk the "third-pointed style" was far less rigid than in other parts of England, and often retains features of an earlier style. The spandrels of the roofs of the aisles at St. Peter's Mancroft are filled with geometrical tracery, and the tower-lights at the beautiful church at Sall,* near Norwich,

* Sometimes spelt Sallie.

show the same characteristics. The windows of the choir clearstory in Norwich Cathedral look like transition from Decorated to Perpendicular, though they are really quite late in style; about 1460. In the woodwork this is still more remarkable, and a kind of Flamboyant treatment is noticeable in many of the late Norfolk screens. Possibly the constant intercourse with Flanders may have had some influence upon the style. There are considerable remains of the cloisters of the Dominican monastery, and a curious crypt (fig. 3), which probably formed the basement of the chapter-house. It has simple vaulting, entirely constructed of brick, ribs and all; it looks like fourteenth-century work. The whole must have formed a noble building in ancient times, and it has most fortunately escaped destruction.

Another most interesting building is the church and hospital of St. Helen and St. Giles, now usually called the "Old Men's Hospital." Everyone visiting Norwich should see this. The church consists of a nave and aisles, a long choir without aisles, a tower at the south-west angle, a transeptal chapel to the south, and a very long vaulted porch on the same side; the transeptal chapel is also vaulted. The eastern half of the nave alone is now used for ecclesiastical purposes, the choir being floored across at half its height. The upper portion, called "The Eagle Ward," has a semi-octagonal panelled roof, each compartment of which is adorned with a black spread-eagle, with red legs and gold beak, a most interesting example of Mediaeval decoration.

The choir shows an example of the peculiarity which we have previously noticed. The windows on the north side (fig. 4) have Late Decorated and Perpendicular tracery

alternately, yet there can be no question that they are all of the same date.

The buildings of the hospital attached to the church are exceedingly picturesque; there is a fifteenth-century refectory, a sixteenth-century kitchen and buttery, and a lovely old cloister lit by three-light, square-headed Perpendicular windows (fig. 5). The garden has old trees in it, and a simple flower garden; it is a reposeful, old-world spot, delightful for its tranquility and appearance of genuine antiquity. The master's house is also well worth seeing. The people are most polite, and make no difficulty in showing the place to strangers, though their courtesy should be received as a favour, as the hospital is not supposed to be open to visitors.

The churches of St. Andrew, St. Laurence, and St. George-Colegate are all Perpendicular churches inspired by St. Peter's. St. Peter-per-Mountergate is a single-spacer church; St. Michael-at-Plea has a single nave, with a chancel and small vaulted transeptal chapels. The reredos of the altar is now adorned with old panels which formerly were portions of the rood-screen. The Crucifixion, Annunciation, and Resurrection are good examples of fifteenth-century painting, though the faces have been all mutilated. The Norwich churches are not rich in church furniture; only one rood-screen exists, at St. Andrew's, and that is not *in situ*, but placed under the tower arch. Some of the fonts are good, especially those of All Saints', St. Swithin's, St. Mary-in-the-Marsh (now in the cathedral), and St. George's, Tombland; the last named is Norman. The font at St. Peter's Mancroft, which is new, has a canopy over it, partly ancient and partly a recent restoration.



Fig. 4.—North Side of Choir, St. Helen and St. Giles.



Fig. 5.—Hospital of St. Helen and St. Giles.



Fig. 6.—St. Mary's Coslany.

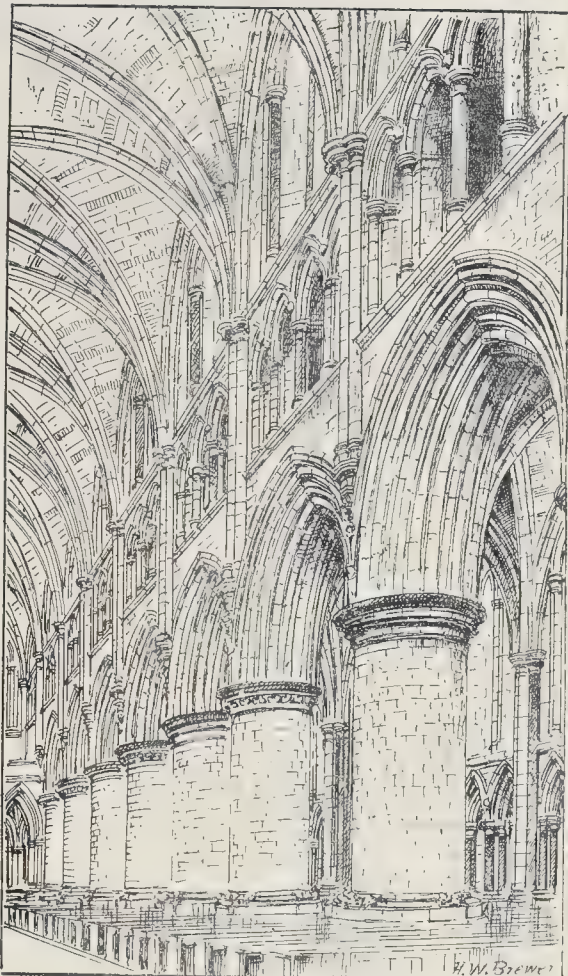


Fig. 7.—St. John the Baptist (R.C.) Church.

The whole of the old one existed in the memory of people now living. St. Mary Coslany has an ancient pulpit, and there are fairly good stalls at St. Peter's Mountergate. There is little old stained glass to be seen in Norwich, but the east window of St. Peter's Mancroft, is a fine example; it used to be said that this was "brought fromgium about a century back," but it certainly looks like English work. There is no old glass in the east windows of St. Peter's and St. Peter's, Hungate; the latter is a pretty little cruciform church, the tower of which was taken down some years ago. The east window of St. Stephen's Church is an interesting example of post-Reformation glass, dated 1601. There was, if we remember rightly, a similar window at St. Andrew's, which has given place to modern glass. The Churches of St. Julian and St. Michael-at-Thorn retain vestiges of ancient work—Norman doorways, for instance. It is said that Saxon work exists at St. Julian's, neither the round tower nor the so-called Saxon arch look earlier than the twelfth century. Amongst other Norwich churches, St. Michael's Coslany is remarkable for the aid flint-work upon the walls of a large east-chapel. St. Giles' Church is noteworthy for a very fine Perpendicular tower, 140 ft.

high; and as it is on the top of a lofty hill, it is seen for many miles round. Two interesting old churches, we regret to notice, are being allowed to fall into ruin—St. Mary's Coslany and St. Swithin's. St. Mary's (fig. 6) is a very elegant building, an aisleless cruciform church. There are no arches at the "crossing"; the roofs, which are rather rich work, mitre in the centre; the treatment is not very usual, and is consequently interesting. The church is lighted by unusually large Perpendicular windows. It has an excellent porch, and a singular and very slender round tower at the west end, upon which is a twelfth-century inscription in Old Norman French recording the gift of a lamp to the church; there is a little good stall work, and a Perpendicular pulpit. The condition of the building is lamentable; there is scarcely a whole pane of glass in any of the windows, and the internal wood-work is being smashed up by flints and brickbats thrown in through the windows. St. Swithin's is another old church in a still worse condition. It consists of a nave and aisles of four bays, and has an excellent open roof. The tower was pulled down some few years back, and the church shut up. It possesses a beautiful font and several ancient brasses. It is sad indeed to see these two old churches neglected and falling into decay. If they are no longer required as churches could they not

be used as meeting places for catechism-classes, or for lectures upon theological and biblical subjects? We trust the members of the Church Congress will be able to suggest some means of preserving them. Another charming building, though no longer used for ecclesiastical purposes, is the old chapel which is now used as the Grammar School. It is a simple parallelogram, of four bays in length, with turrets at the angles and a curious porch, shaped like the letter L, at the west end; the building has a crypt under it which is partly above ground, and is lighted by large circular openings richly cusped. The upper floor, or chapel, is of excellent Decorated work, with beautiful mouldings to the windows, and a singularly elaborate piscina. The porch is very ingeniously vaulted with segmental groining and rich bosses. The inner door has one of the most beautiful sets of hinges we have ever seen, adorned with intertwined oak-foliage; it is an early and most valuable example of English smith's work. We are glad to say that, although this building is used as a school, it has suffered little injury. Many objects of interest are to be seen in the two great "closes," which environ the cathedral, especially their four gates—the Erpingham, St. Ethelbert's, the Water Gate, and the Alnwick Gate. Although the greater portion of the Bishop's Palace is modern, a fine fragment of the great hall is left, and the

chapel, which was rebuilt in the time of Charles II., retains its old windows; like the fragment of the hall, they are exceedingly rich Late Decorated work, the tracery all wrought in two or three orders of mouldings, the mullions shafted and filleted, and possessing beautifully carved capitals. In the fragment of the great hall the arch-moulds are interrupted about every 14 in. or 15 in. by masks and delicate foliage kept very flat, so as not to destroy the lines of the arch-mould. When perfect, this great hall must have been a most noble work, for the existing fragment, which is about 40 ft. by 30 ft., was only the porch.

We cannot here describe the numerous interesting examples of civic and domestic architecture in this fine old city. Before concluding, however, we must say a word or two about the Roman Catholic Church of St. John the Baptist, now being erected at the sole expense of the Duke of Norfolk, for the use of his co-religionists. The exterior of this building is at present seen to great disadvantage, because one generally approaches it from the east, and as the nave and aisles alone are completed, what one sees are a temporary brick east-end, a fragment of the old gable which stood upon the site, a large temporary sacristy, and a range of workmen's sheds. The scale of the building, however, may be judged by the fact that the nave and aisles alone are 170 feet long; the choir, lantern, and transepts, which are in course of erection, will add about another hundred feet to the length. The style selected by the architect, Mr. Gilbert Scott, is very severe Early English (almost Transitional). The walls are about 4 ft. 6 in. thick; which, together with the vast cylindrical columns and stone vaulting, give the church a degree of massiveness rarely met with in modern churches, and impart a kind of "monumental" character (fig. 7), which is singularly impressive. Although the portion of the church already completed is used, the furniture is all temporary. When completed this building will certainly be one of the finest churches of modern times, and probably the most massive in point of construction.

In conclusion, we congratulate the members of the Church Congress upon the appropriate and most interesting surroundings amidst which their meetings will be held this year. They will find quite enough to interest them in Norwich itself, but should they desire to make excursions, the noble abbey church of Wymondham, the churches of Sall, Cawston, and Ranworth, with their splendidly-painted rood-screens; East Dereham, and Yarmouth (which latter possesses the largest parish church in England, larger than nine of the cathedrals), may be easily visited. But the whole neighbourhood is so full of ancient churches and other objects of interest, that it is impossible to make an expedition in any direction without coming across some object which will repay one for the time spent and the trouble taken.

NOTES.



LETTER from Mr. Lambros in last week's *Athenaeum*, giving a summary of the methods proposed respectively by Herr Ziller, Professor Durm, and M. Lucien Magne, for keeping the Parthenon in repair, forms a somewhat alarming document. Herr Ziller indeed is very conservative in spirit, and emphasises his desire to see the Parthenon preserved "without modern patch-work," by which he means the introduction of new architraves, capitals, or shafts; but he proposes preservation by the application of patches of some kind of stone cement, for joining and filling up gaps; a process which would no doubt avoid introducing new details among the ancient work, but which would be a terrible injury to the appearance of the remains. Professor Durm is dead against the cement, but considers that the architrave

which is in danger* must be replaced in marble; that there may be no need to use new marble for this purpose, as there are enough old pieces lying about; but that even the use of new blocks would not be detrimental to the effect, as the iron ingredients in the Pentelic marble would soon assimilate the new work with the old. The "soon" we should take leave to doubt. M. Lucien Magne, who is a member of the "Monuments Historiques" department in France, also talks of the introduction of new stones; but seems to lean towards effecting as much as possible with metal cramps, which will certainly have the advantage of not being so noticeable as new stones. We should suggest that it may be possible to effect all the necessary strengthening by means of metal cramps and ties, which would have the advantage of showing exactly what they are, and not introducing patches of new stone into the ancient work. One is afraid to think, besides, what liberties may be taken when once the introduction of fresh material is entered upon. The startling remark occurs in Mr. Lambros's letter, that there had been a misunderstanding as to Professor Durm's statement that a million francs would have to be spent upon the repair of the Parthenon; about 50,000 francs is required for immediate repairs, about 200,000 francs for all repairs ultimately necessary, the remainder (of the million) "is required for the complete restoration and decoration of the Parthenon." This is truly an alarming sentence, and we should like some further explanation of it.

TWO artistic questions came before the London County Council this week. One was the possible establishment of an Arts and Crafts Museum for London, in regard to which Mr. W. M. Thompson moved that it should be referred to a Special Committee to prepare a scheme for the establishment of such a museum, a resolution which was substantially carried, in a slightly different form. The recommendation of Mr. Burns, that the Imperial Institute should be made use of for the purpose, is not likely to receive any serious attention, but it is by no means so preposterous as some of Mr. Burns's proposals, and we quite agree with him that the Imperial Institute is made little good use of at present. The other point was in regard to the new bridge at Vauxhall. We do not quite understand Mr. Jones's question, which will be found in our report of the County Council proceedings. Did he mean to request that the design proposed by the Institute of Architects, or the design proposed by the County Council Engineer, should be exhibited to members in the form of a model? Or does he mean to request that the Council, having decided on the form of bridge they intend to build, should exhibit that as a model? If the latter, we fear the exhibition will do little good; most members will simply adopt it to save further trouble about a subject they feel no interest in. Both designs should be shown, either in drawing or model, and they should be open to the general public, not to members only. It is characteristic of the attitude of London journalism towards architectural subjects, that the *Times*, in a report extending to a column and a-half, does not even mention the fact of the question of Vauxhall Bridge having been before the meeting.

THE bad effect of the clock-face on the southern tower of St. Paul's Cathedral is beginning to excite the criticism of artists and architects, and not without reason. The glazed face of the clock, as compared with the deep shadow in the corresponding circle in the north turret, entirely destroys the balance of the architectural effect of the two

towers; and, moreover, in the way in which the figures and hands of the clock are fixed it is totally useless to show light at night, a transparent dial, which was the purpose for which it was apparently fixed. In the arrangement in this respect shows a most extraordinary oversight. The transparent portion is only the size of the opening in the masonry; the figures are painted on the circular architrave round the opening over which the minute hand, of course, projects. The consequence is that, when the clock face is illuminated at night, the figures are invisible, and the two hands appear of equal length, the portion of the minute hand which projects over the architrave being, of course, invisible. The proper treatment would be to remove the useless glazed dial altogether; to fix an opaque front plate to the clock considerably further back, and such a colour as not to be noticed, so as to give the opening the same depth of effect as that in the north tower; to have a couple of well-designed clock-hands standing forward just beyond the wall-plane; to remove the figures and clean off the black paint from the architrave of the circular opening, and to insert metal hour figures and a minute circle, let into the clean stone and gilt. The clock would then do its duty without being a defacement to the façade, and without presenting the absurd spectacle of a transparent dial so designed as to be entirely useless.

THE opposition which the employment of the "trolley" system of electric tramways, continues to receive from municipal authorities on account of the alleged disfigurement of the streets by poles required, has turned the attention of inventors to conduit systems. There are several practical conduit systems, the best known is the one employed at Budapest. This system is also used by the Metropolitan Street Railway Company of New York, their Lennox-avenue electric line, the result of the working of which, during the year, show a saving of four cents per mile over cable-traction, and eight cents per car-mile over horse-traction. Of other methods the following, which has been successfully tried in France, is worthy of notice wherever it is contemplated to change a horse tramway system into an electric tramway system, as the old rails are to be utilised. A little underground tunnel, whose dimensions are about 2 ft. 6 in. square, is made between the rails, communication with the interior being made by a narrow slot. An electric truck runs on a double row of rails bolted to sleepers inside this tunnel, and it is yoked to the tramcar by a metal rod, which also carries insulated wires, enabling the driver to control the motors. The truck carries two motors of 8-horse power each, the current required being brought by "feeders," conduits with which is made by means of a track inside the tunnel, and the current returns by the rails, which can be perfectly insulated. The slot, which need not be greater than three-fifths of an inch in diameter, thoroughly cleaned by a special brush attached to the truck. This system, of course, cannot compete with the "trolley" system in cheapness, but where the latter is prohibited it will prove a formidable rival to cable-traction.

THE proposal to make Dr. Johnson's house at Lichfield into a Johnson Museum is an excellent one, provided there are sufficient relics to be found to put in it. In these days it is very desirable that small local museums should be established where it is possible, and when there exists some house which has once been the home of a famous man which can be used for the purpose the task is made easier. Often as soon as any such building is opened donations from the most unexpected quarters are sent. There are many private individuals who possess relics or things of great interest.

* The present state of the Parthenon was described and illustrated by sketches, by Mr. Somers Clarke, in our issue of June 22 of this year.

who are only too glad to hand them over to a public trust if one can be found to take charge of them. Milton's cottage at Chalfont St. Giles, in Buckinghamshire, of which there was a sketch in our last number, is, for example, now made a museum for relics of the past, and we believe various interesting mementoes of it have found their way there. It is notable that the Parish Councils will usually form the best body to take charge of these buildings, as it is, though individually unable to change, a permanent body. We could much like to see some kind of appeal made by the Society of Antiquaries, or the Society for the Preservation of Ancient Buildings, to the Parish Councils throughout the country, to look into this matter of historical buildings, with a view to their preservation for future generations.

THE architecture of Manchester has received a notable addition in the new Lands Library, which is now approaching completion in Deansgate. Mr. Champneys has certainly designed a building which attracts attention. It is a quaint red sandstone structure, partaking of the nature of a mediaeval fortress, a college, and a cathedral combined. The stranger to the city stops in front of it and wonders what it is. The lives are at a loss whether to praise or blame it, for there is nothing else like it in their midst. The front is really a study in contrasts—a somewhat heavy-towered facade, with deeply-recessed windows, and crowned with two rich light octagons all over and panelling, the octagons backed by overtopped by plain massive square towers, and between the towers a great arched window and gable like lacework. The contrasts are somewhat too strong for liking, but the building is undoubtedly a clever and original structure, well worth a further study.

WE observe that there has been a move for the formation of a new provincial architectural Society to represent Devonport and its neighbourhood. According to a report in the *Western Daily Mercury* of last week, a meeting has been held at the Town Hall to consider the subject, and the Council of the Devon and Exeter Architectural Society was invited to visit Devonport on the 26th, in order to confer with the Three Towns' architects as to the advisability of forming a branch for the neighbourhood. A committee has been appointed to make arrangements for the meeting.

THE third exhibition of the "Photographic Salon" at the Dudley Gallery has much the same character as its predecessors, but in some of the landscape studies there is more of a realisation of the sentiment of landscape than we have hitherto seen in photography, and in this sense of work it seems that the effort to give photography something of the character of painting has more chance of success than in the past. Figure subjects, owing to the fact that they are poetic, whereas man too often is "a poor woman either," as Hamlet says, are carefully selecting the right point of view, the most favourable conditions of light, and the photographers have succeeded in giving very pictorial landscape effects, as in Scott's "Morning Mists" (61), Mr. Davis's "The Coast Road" (104), Mr. Greger's "Ormy Day on a Norfolk Estuary" (201), Mr. Anglois's "Stormy Sunset" (22), and some others. Is Mr. Lankester's "Evening" (3) really an unworked photograph? We would doubt it; it looks to us as if the reflections had been artificially worked on. Occasionally a landscape-photograph is as good a lesson as to facts; in No. 14, "November Evening," for instance, the level of light on the water might be thought conventional if the same effect were intended. When we come to attempts at

ideal figure scenes the results are mostly as absurd as usual, as in "Sunshine and Shade," where the figure is totally devoid of the sentiment which a painter would impart. The attempt to treat nude subjects, which, of course, can only be done under considerable restrictions in photography, affords a still more absurd example of the difference between the ideal and the real, as in "Startled" (195), showing a nude figure standing by the margin of the sea with her back to the spectator, the figure totally devoid of charm, and the narrow waist and straight lines of the torso, sloping outward to the shoulders, exposing mercilessly the effect of modern dress on the female figure. The only one of these studies in which any beauty of pose is to be found is in the reclining figure in "Ebb-tide" (196), in which a happy composition of lines has been attained. Two other figure subjects however, merit commendation, Mr. Puyo's "Vengeance" (299), a draped figure with a dagger drawing a curtain back, in which there is a really striking effect of expression and lighting; and Mr. Demachy's "Jeunesse" (31), a photograph of the head and bust of a young girl, with the head turned away from the spectator, which is very *spirituel* in line and expression, and might be a study of Fragonard's.

THE list of Royal Academy Lectures for the ensuing session includes six lectures on painting by Mr. W. B. Richmond, to be delivered on January 6, 9, 13, 16, 20, and 23; and six lectures on architecture from Professor Aitchison, to be delivered on January 27 and 30, and on February 3, 6, 10, and 13. The subject of Professor Aitchison's lectures will be "Romanesque Architecture." Mr. Richmond's first lecture will be general and preliminary, the remaining five will be occupied with the interesting subject of the Sistine Chapel.

LETTER FROM PARIS.

THE Paris papers, which have been reproaching M. Bernier for his dilatory procedure in the work of rebuilding the Opéra Comique, are now obliged to confess that the building-yard in Rue Favart is in full activity, and the new building visibly progressing. There was, in fact, some delay at first, but the walls are now going up rapidly. The plan of the stage and the auditorium can now be made out, and the granite columns of the principal facade will be up in a few days, while the party-walls which are to separate the theatre from the houses in the Boulevard des Italiens are also in progress. The sight makes one the more regret the parsimony of the Government, which, in order to save a few hundred thousand francs, has not chosen to remove these houses and make a facade towards the boulevard. Architectural effect, as well as public security, would have gained by this course, which would have completely isolated the new building.

On the left bank of the river M. Lheureux has completed the shell of the new buildings for the Faculté de Droit. The building, of which the main entrance will be on the Rue St. Jacques, will include a large Salle des Pas Perdus, three stories of lecture-halls towards Rue Soufflot, and the book-store buildings towards Rue Cujas. In the centre the main court forms a very large square hall, covered with an iron roof, and intended to serve as a reading-room for the students. The new facades will have two pediments decorated with sculpture by M. Jacques Corbel, a pupil of MM. Thomas and Cavalier. The old library, built by M. Lheureux seventeen years ago, is to be entirely demolished, and the Archaeological Department intends to take advantage of this occasion to institute a search for certain Gallo-Roman tombs which are supposed to exist in this corner of Old Paris. The whole building will not be complete and ready for occupation before the end of 1896.

In the same neighbourhood we may notice that the scaffoldings which for two years have covered the facade of the Pantheon are now partly removed and the restored facade rendered visible. The repairs to the lateral facades will be shortly undertaken, though unfortunately it is probable the work will be a good deal interrupted by the

approaching winter. In the interior, the sculpture model, 8 metres high, has just been reinstated in the apse, whence it had been removed for the celebration of the obsequies of President Carnot. This model, the work of M. Falguière, represents "La Liberté éclairant le Monde." The pictorial decoration of the interior proceeds very slowly. The work commenced on the left wall by the late Elie Delaunay was taken up after his death by M. Gustave Moreau, who, with the assistance of one of his pupils, M. Courcelles-Dumont, has nearly completed it. The subject is "Ste. Geneviève arrêtant Attila." It forms a pendant to the "Vie de Ste. Geneviève" painted on the right wall by M. Puvis de Chavannes, whose simple style and pure colour harmonises better with the building than the work of M. Bonnat and M. Gustave Moreau. The entire completion of the work of decoration will still occupy five years.

M. Humbert has commenced, in the ancient chapel of Ste. Geneviève, the execution of four compositions which will form a pendant to those already painted by M. Théodore Maillat in the Chapel of the Virgin. One of the pictures, representing "Pestilence," is already completed.

While speaking of the repair and decoration of the monuments of Paris, it may be observed that the Column of Victory in the Place du Châtelet is in a very bad state, and will shortly require to be taken in hand in the same manner. The granite pedestal and the sphinxes which decorate it have been cleaned up; but the large symbolic figures at the base of the column, executed by Boizot in 1807, are in danger of falling to pieces, and will certainly be lost unless speedily attended to.

Unfortunately, when it comes to a question of restoration, it too often happens that this is by no means confined within the proper limit of repairs. The new work done is consequently sometimes as prejudicial to the monuments as the ravages of time and weather. The cleaning and the scraping to which, with well-intentioned zeal, the old works in Paris are from time to time subjected, have had disastrous effects in some instances; and the "Société Protectrice des Monuments," presided over by M. Charles Garnier, is much troubled on this account. It has at last obtained from the Department des Bâtiments Civils an assurance that in future restorations, if considered necessary, shall not be undertaken except with extreme precaution and consideration.

The municipal administration, on its part, under the pressure of recent articles in the papers, has been occupying itself about the condition of some of the tombs of eminent men which are among the objects of interest of the Parisian cemeteries. Many of these are almost in ruins. In the Cemetery of Montmartre, for instance, the figure of "Jeunesse" on the tomb of Henri Mürger is covered with moss, and the stone everywhere disintegrated. Not far from that is the tomb of Théophile Gautier, in almost as bad a condition. While we are continually erecting monuments to eminent men, we seem to be leaving the existing ones, which have as much claim on public interest, to decay.

Among the new monuments which the Municipality will soon have to inaugurate is the group of Washington and Lafayette, presented to the city by M. Falizer. This group in bronze, which was exhibited in the Salon of 1892, is the work of M. Bartholdi, and is to be erected in the Place des Etats-Unis, on a pedestal designed by M. Formigé. During this month there will also be inaugurated, at a new school in the Rue des Martyrs, the marble bust of Edgar Quinet, the work of M. Coulon; while in the Parc Monceau there is the monument to Bizet, the composer, to be inaugurated, the work of M. Falguière as sculptor and M. Chas. Garnier as architect. The monument to M. Alphonse, to be erected in the Avenue du Bois de Boulogne, has just been delivered over by M. Dalou to the artisans. The monument is composed of a hemi-cycle in white marble, the balustrade of which bears two splendid bas-reliefs representing respectively "Travaux de la Rue" and "Travaux des Jardins," a symbol of the works with which Paris was beautified under the direction of Alphonse. In the rear is the statue of Alphonse on a pedestal decorated with figures representing Painting, Sculpture, Civil Engineering, and Artistic Gardening, under the form of modern works bearing in their hands the instruments of their different arts. The statues will be in white marble.

In regard to the monument to Alfred de Musset offered to the city by M. Osiris, the execution of which was confided to M. Falguière and M. Mercie, it is not known at what date it will be finally erected in the Place St. Augustin. The model

submitted by the two artists was accepted long since by the Municipal Fine-arts Committee. The delay probably is caused by the artists themselves, who have been interrupted in the work by other commissions. It is the same with the statues of Corneille and Racine which are to decorate the Place du Théâtre Française, and which seem to have been entirely forgotten; rather a poor compliment to the memory of two great French writers whose masterpieces are still always received with applause.

At this time of the year exhibitions are rare, the world both of fashion and of art being for the most part out of town. The second exhibition of the "Peintres Impressionistes et Symbolistes" is however open in the Rue le Peletier. It contains a certain number of original works, executed by a small group of artists who contentedly follow, without much encouragement, the eccentric path they have chosen; among whom may be named MM. Lebeuvre, Maxime, Dethomas, Georges d'Espagnat, Loiseau, Maillot, De Peske, Bourdin, and A. L. Regnier, whose "Narcisse des Poètes" is a meritorious picture of its kind. M. Angrand and M. Anquetin, whose works are better known, have sent some fine drawings.

Last week the International Exhibition to celebrate the centenary of the Art of Lithography was opened at the Palais des Beaux-Arts. This very interesting exhibition is divided into two sections. One, devoted to lithographic industries, is arranged in the Galerie Rapp. Visitors can here follow all the processes of chromo-lithography, and see the work carried on before their eyes by the young pupils of the Ecole Estienne, or "Ecole du Livre," organised by the Paris Municipality. The section, which is purely artistic, does the greatest credit to the committee, which has collected more than two thousand rare plates, classed methodically, so as to illustrate the progress of the art during the last hundred years. Among others is a drawing executed in 1804, by the painter Bergeret, who was one of the first adepts in the process invented by Senefelder. There is a large retrospective collection, among which are to be found charming productions by Horace Vernet, Isabey, Charlet, Johannot, Henri Monnier, Jean Gigoux, Guérinault, Daumier, Raffet, and Gavarni. Other rooms are devoted to the works of modern artists in lithography, the number of whom has greatly increased within the last ten years. Among them may be mentioned those of MM. Mauron, Lunois, Mesplès, Dillon, and the curious lithographs in colour executed during the latter years of his life by John Lewis Brown. Special mention should be made of the section reserved for English lithographs, organised with the assistance of Sir Frederick Leighton, which offers the double attraction of showing a great deal of admirable work and of introducing us to the names and productions of some artists entirely unknown in France, where the movement of artistic production in other countries seldom receives sufficient attention. The organisers of the exhibition are much to be congratulated on the methodical arrangement and artistic taste displayed, which have secured for it a deserved success.

At the École des Beaux-Arts, where MM. Dutert, Sedille, and Nénot are candidates for the succession to the position held by M. Ancelet, the architectural competition for the Chaudesaigues Prize has just been decided. The prize has been awarded to M. Hublot, pupil of M. Lambert, and a "First mention" to M. Berger, pupil of M. Guadet.

In the vacation season little work is done at the museums. We may notice, however, the enlargement of the galleries in which is kept the interesting collection of the Hôtel des Monnaies. The arrangement of the two new rooms is now in progress, and will enable the management to bring before the eyes of the public many things which there was hardly space to exhibit before. Among these is a bronze model of the Vendôme Column, a beautiful piece of work, for which a very large sum was offered by some Americans who wished to secure it. The new rooms will not, however, be open to the public for about six months.

The Municipal Council will be occupied in the ensuing session, among other matters of public improvement, with the consideration of a scheme for a double counterbalance hydraulic lift from the Rue Foyatier to the Rue Lamarck, giving an easy access to the extreme point of the Butte Montmartre, which is at present not at all easily accessible. The reservoir at Montmartre will be utilised for working it, the water being afterwards made use of to supply water for a cascade to be

formed in the future square of Montmartre. It is an interesting experiment at a moderate cost, the expense of the first installation being estimated at not more than 110,000 francs.

We have to record the death of a sculptor of talent, M. Albin Gaubert, a pupil of M. Falguière. He was successful in several competitions, and his last exhibited work, "La Bulle de Savon," gained him an "honourable mention" at the Salon of 1894. It is sad to have to add that he suffered a terrible struggle with fortune, often passing days almost without food, and his last illness was probably due mainly to want and consequent suffering.

AMSTERDAM FIRE CONGRESS.

THE Fire Congress which was held at Amsterdam last week was essentially a business meeting, and had nothing in common with the usual fire brigade tournaments and merry-making which are often known by similar names. The gathering was essentially a meeting of experts in fire protection, who had met to discuss the various aspects of certain controversial questions, and among the experts, fire brigade officers, architects and engineers, insurance officials, and statisticians were equally represented. It was the first occasion, to our knowledge, that a gathering of this kind has been arranged in Europe, though America has already had similar meetings for some time back. The initiative was given by the former pupils of the late Chief Officer Studé, of the Berlin Fire Brigade; and Commandant Meier, one of the youngest officers in the fire service, was able to realise the scheme, with the assistance of the Dutch Government and Municipal Authorities of Amsterdam.

The Executive Committee which was formed, and of which Herr Meier was Chairman, included the Presidents of the Dutch architectural and engineering societies, and representatives of the most important insurance offices. There were five foreign members on this Committee: Chief-officer Giersberg, of Berlin, Sir Eyre M. Shaw, Chief-officer Simmonds, Mr. Thomas Blashill, and Mr. Edwin O. Sachs, of London, but, unfortunately, Sir Eyre M. Shaw and Mr. Simmonds did not attend the meetings. The four Honorary Secretaries of the Congress were M. Kießer (Amsterdam), Herr Dittmann (Bremen), M. Cacheux (Dieppe), and Mr. Sachs (London). The number of delegates attending was over two hundred, and of the foreigners the majority were Germans.

The German, Belgian, and Dutch Governments were officially represented, and likewise the Municipality of Paris and a number of learned societies. The election of the vice-presidents under these circumstances caused some difficulties. Mr. Blashill, though not officially representing our County Council, was given this distinction, together with the Government representatives, in recognition of the services he has rendered in the revision of our Building Act, our theatre regulations, and the erection of model fire-stations—work which is, perhaps, even more appreciated abroad than in this country.

The work of the Congress was divided into three sections:—

1. Fire Prevention.
2. Fire Combating.
3. Building Construction.

And for each of these a number of papers were prepared by invitation. French was the official language of the Congress, but the papers were read in the respective languages of the authors, and, strange to say, the discussion was nearly always continued in German. The meetings were very well attended throughout, and the discussions on most of the subjects very animated. With some few exceptions the papers were short and to the point, and the time limit for the discussions well kept.

We cannot attempt to give a *résumé* of the many papers which would be of interest to architects, and among these we include the able report on lightning conductors presented by M. Maurits Snellen, the Director of the Dutch Meteorological Institute, and a lecture on the dangers of electric wiring by M. Dufour, of Amsterdam, which was very well received. The resolution in connection with this lecture practically pointed out the advantages of a very stringent control on the part of the insurance offices, but we should prefer to see control of this kind in the hands of public authorities, say in connexion with the Building Acts executive, instead of the interested fire underwriters.

"The Flash Point of Petroleum" (Dr. de Bruyn) was one of the subjects that excited most interest among municipal engineers, and led to a

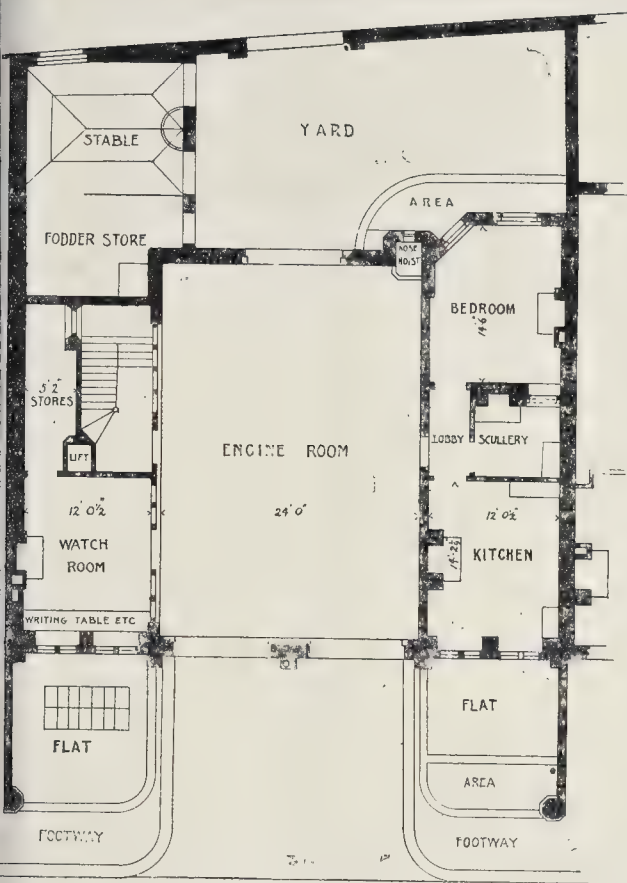
very lively discussion on the opening day, the Mayor of Amsterdam and the leading authorities of the city attended the meeting. A resolution in favour of 40 deg. C. (Test Abel) was result of the deliberations, and should be of value to those entrusted with the construction of storage tanks and protection of the public.

"Water Damage at Fires" (Mr. Sachs), one of the papers which resulted in a unanimous resolution, and it would here be well to point out that plain pugged floors not only have the advantage of being fire-resisting to a certain extent also invaluable against water damage in domestic risks.

"The Aspect of Various Systems of Houses regards Danger from Fire" (M. Huy) also led to a unanimous resolution, the report of which also included a recommendation to the insurance companies to consider the advantages of certain systems when they fix premiums. Three papers treated of fire-resisting construction, but unfortunately no resolution could be arrived at, even after referring the question to a special committee. The opinions on subject varied too much to be generalised, and any future occasion the subject will have to be divided into sections before it is put before a meeting of this kind. The papers were by Sir Officer Prinz, of the Altona Fire Brigade, Noordendorp, an architect practising at Bost and M. Neissen, of the Board of Works, Rotterdam. The papers referred to a great deal to the various experiments and tests at Berlin, Hamburg, and the unfortunate results at the Hamburg warehouse fires.

The English paper which was of most interest to the Fire Brigade officers assembled at Amsterdam was no doubt the one contributed by Thomas Blashill on the new London fire station. Some excellent plans were shown illustrating new stations at Brompton and New Cross; the Congress greatly appreciated the loan of drawings.

Mr. Blashill described the more recent kind of fire-station now being erected in London at a rate of about four new stations per annum, in the first place pointed out that in the design of a fire-station it is essential that the architect should be in close touch with the chief officer of the fire brigade. During many years past stations have been designed after the most casual consultation with the late officer, Sir Eyre M. Shaw, and the present chief officer, Mr. J. S. Simonds, and their advice has always been put at the service of the Fire Brigade Committee. Mr. Blashill then went on to point out the main objects in the design of a fire station are, the proper accommodation of the firemen and fire appliances, and to ensure that, upon the receipt of an alarm, the fire engine and other appliances, with its complement of firemen and horses, should be despatched in the shortest possible time. In London a satisfactory fire-station of the ordinary kind can be built upon a site which is 50 ft. and 100 ft. from front to rear. Brompton station, which is an ordinary one, and of which we show the ground-plan, measures 52 ft. across and only 58 ft. from front to rear. The Cross station measures 120 ft. in width, 170 ft. from front to rear, but this is the station of one of the five districts into which the Metropolitan Fire Brigade is divided, a so-called "district station." Mr. Blashill then pointed out the advisability of stations being placed on a corner site, so that they may have two faces fronting streets. It is sometimes possible to find a site with three faces fronting the streets; but there are also stations, which Brompton is an example, where the engine and rear only face streets. In a London station the chief feature is the engine-room, which should be about 27 ft. wide, and 34 ft. from front to rear; this will accommodate two fire engines standing side by side, and leaves sufficient room for passing between. Wherever it is possible, the stable is placed immediately behind the engine-room, into which the doors of the stable open ready for duty, stand with their heads facing the engine-room, but there are generally only two or three stalls of the ordinary kind where the horses may rest. The watch-room is a front room adjoining the engine-room, and is also used as a telephone room. With regard to the accommodation of the officers and men, Mr. Blashill went on to explain that it is now practice to provide in each station a recreation room, where the men can spend their time waiting their turn on duty. The single men are accommodated, have their own mess-rooms and dormitory. Each of the married men



GROUND PLAN

Plan of Fire Brigade Station, Brompton.

ded with a kitchen, a bedroom and a scullery. The engineer in charge of a small station has one additional room, and the superintendent in charge of a district has two additional rooms, an office and a bath-room. It has been the practice to provide the entrance to the station from each married fireman from a passage in the main building, but recently these entrances have been made, as far as possible, from open air, so that each man has practically a direct access to the open air. There is, however, only one entrance to the station, and that is through the engine-room, so that when a man enters or leaves the building, he can leave notice at the watch-room. A shaft for drying fire-hose is enclosed in the staircase, and is about 56 ft. high. The staircase is a look-out tower, which is generally about 80 ft. high. Already mentioned, Mr. Blashill's paper and drawings were much appreciated, but some were called for criticism, and of these the protest of the chief officer of the Brigade only called in to "advise" the architect and Fire Committee seemed to cause much amusement. The Foreign Fire Brigade officer is used to his instructions in an authoritative manner, and he requires a new station, and not only "advise" the architect; a position which, it is for us to us, must often militate against the stage of his getting the full benefit of the effect and perception of an able architect,

who can sometimes tell a client better what he wants, or at all events how it can be done, than the client knows himself. Then the idea of the men, who are supposed to reach their engines before the officer, being given rooms on a higher floor than the superintendent, did not appear very practical, and the necessity of everybody (including the officers and their families) having to pass through the engine-room to enter the fire-station was not recognised. It is of some interest, however, to hear that the new stations at Amsterdam, Berlin and Hamburg will show several of the principal features of the London stations.

Mr. E. A. E. Woodrow, of the Theatres Branch of the London County Council, read a paper in which he very thoroughly described our theatre regulations, which he drafted some years back under Mr. Blashill's directions. We have so frequently referred to these regulations that we may pass over Mr. Woodrow's description, excepting as regards the question of site, where we would wish to endorse his views, that however great the advantages of an isolated site are, a hard and fast rule as to total isolation is quite impracticable for London. Some interesting particulars as to the control of theatres were given, and the recommendation for regular fire-watches in our theatres calls for attention. Theatre-watches in London, however, mean an increase of our fire brigade by about 150 men, and there are numerous difficulties in the provision of the funds, as

the theatre managers would probably oppose any innovation of this kind and not contribute to the cost.

As regards the repetition of the Congress, we trust that London will follow the example of Amsterdam, and utilise the opportunity, afforded next year by the Fire Brigade Tournament, which is being arranged by the National Fire Brigades' Union, to call together a practical business meeting of Fire Brigade officers, architects, engineers, and actuaries to continue the work so successfully commenced. Regular gatherings of this kind, if carried out in the same spirit as at Amsterdam, are likely to be useful to all concerned. It is time, too, that our Government and the London County Council should cancel their policy of keeping aloof from everything connected with systematic fire protection. There is no doubt that we are behind other countries in these matters.

MAGNESITE FIRE-BRICKS IN GREECE

AN interesting Report has just been presented to the Foreign Office on the "Deposits of Magnesite Ore and the Manufacture of Magnesite Fire-Bricks in Euboea." Mr. Ernest B. Maxse, in sending it, remarks that he is of opinion that a new export trade for Greece, which will largely increase year by year, has sprung into existence. He believes that in the near future a great increase of the export of magnesite ore ("white stone") may be expected.

It has been known for some time that there are large deposits of the ore in Euboea and in other parts of Greece, as, for instance, near Corinth. The "Société des Travaux Publics et Communaux" has lately undertaken the working of these deposits and the manufacture of fire-bricks in Euboea.

This Society is practically the only producer or exporter of stone and the only maker of bricks in the district. It owns a number of mines or lodges outcropping high up in the hills some four miles from Krimasi, a small shipping place on the east coast of Euboea and two miles from Linne, a port on the west side. At Krimasi vessels lie close in afloat, but the port is exposed to heavy seas, and affords bad anchorage in November and December. At Linne there is good shelter and nearly always smooth water and excellent anchorage.

The ore is shipped to England and America for lining furnaces, and is sent either crude or calcined. It is also used to extract the resin in wood-pulp manufacture, and also, it is believed, in weighting calicoes. Apart, however, from these uses it is thought that by far the most promising field of operation and the most unique is that of grinding the stone, after calcination (temperature, 1,600 deg. Fahr.) and making from it bricks by machinery, which are then subjected to four days and nights of continuous heat up to 2,150 deg. Fahr. This heat is obtained by the combustion of gas from lignite (also a product of Euboea) by means of Siemens' patent apparatus. These bricks cost 54. 10s. per ton, f.o.b., packed in crates, or about 6d. each. Magnesite cement to lay them with is made and sold at the same price. These bricks will stand a heat of 2,150 deg. Fahr., whereas ordinary fire-bricks of which furnaces are built will not stand more than 1,800 deg. Fahr.* at the most. By using these magnesite fire-bricks a greater heat can be employed and a much more enduring furnace built.

Experiments just made with hand-pressed bricks promise that these can be used for backing, or even alone (but, not being so hard, not to such advantage). As they weigh 20 per cent. less, they will cost less than the machine-made ones.

The principal lode worked near Krimasi has been proved to the extent of 420 metres in length and 20 to 30 metres in thickness (horizontally). It has been worked in two levels from the top, say 30 to 40 ft., and it probably extends right down through the hill, with an apparent tendency to widen out as it goes down. It dips at an angle of about 77 degrees. The other lodges in the immediate neighbourhood, which have been opened up some 50 ft. at the outcrop for examination, are similar in appearance.

The lode gives a general average of about 88 per cent. of carbonate of magnesite, one-third of it approximately being inferior. This is sorted out, and the company sells either by degree of analysis or by degree guaranteed. The company only guarantees 95 per cent. of pure magnesite, though

* This statement should have been qualified; certain kinds of fire-bricks are capable of withstanding a much greater degree of heat than this.

the analysis frequently gives 97.80 per cent. The stone is very hard, and has to be broken out with dynamite, which is manufactured near Athens.

The following is the analysis of good quality stone, such as was shown at the Chicago Exhibition:—

Silica	0.45
Oxide of iron	0.25
Alumina .....	.10
Carbonate of lime	1.40
Carbonate of magnesia	97.80
100.00	

In inferior grades the principal increase is in silica, say to 5 to 7 per cent., this occurring in the cleavage veins or lines.

A well-engineered and constructed carriage-road runs from Limne to Mautudi near the Krimasi deposits and on to Achmet Aga. The surrounding scenery is lovely—pine-clad mountains rising to a height of 4,500 ft., and fertile plains at their base extensively cultivated with a large variety of large-grained bearded-wheat.

At Limne the mail steamer from and to Laurium calls at least every other day both ways, the run taking some twelve hours, including stoppages at Kalkis. A branch line of railway to the point of the mainland opposite Kalkis is contemplated. This is a portion of the Piræus-Larissa Railway as originally planned. Kalkis (otherwise Chalkis) is the seat of the Nomarch (Préfet) of Eubœa. The telegraph-wire runs through Limne to Mautudi, Krimasi, and Achmet Aga, and is carefully constructed, the line crossing the road at several places so low as to require avoidance by carriages or even foot-passengers. The earthquake of last year was severely felt at Krimasi and Mautudi but did not do much harm, but at Kalkis several lives were lost and many houses destroyed, temporary wooden buildings with the red-cross sign being still in occupation.

The crude magnesite stone is shipped in large lumps of dazzling whiteness, and as a considerable time elapses between mining and shipping, the 4 to 4.5 per cent. of moisture in it disappears before weighing for shipment, so that practically buyers are said to incur no loss in weight. A narrow-gauge tram-line connects the mines with the brick-works at the foot of the hills, and thence runs some 4 kilom. to the Krimasi anchorage. Owing to the intense heat employed in this brick-making, the chimney gives out absolutely no smoke. Mr. Maxse regrets to report that young children of both sexes are employed in this industry for far too many hours—practically the whole working day. They are used for carrying bricks and stone, and in chipping visibly defective portions off the lumps of ore. Magnesite bricks are also now being extensively made in America from mineral earth on the spot.

HOW LEAD PENCILS ARE MADE.

The great pencil-making firm of Johann Faber, of Nuremberg, has issued an illustrated description of the process of pencil-making at their works, from which we take the following particulars, which may interest the many among our readers who are constantly using pencils.

The prominent materials in the manufacture are graphite, clay, and cedar wood. The first process to which graphite is subjected is the washing, as the finest graphite contains many substances which have to be eliminated. The washing is effected by means of a number of vats, each a couple of feet lower than the other. Water is let in and the mass is stirred up. The heavier parts go to the bottom, the finer mixture flows through the openings into the next vat, where the same process is repeated until the last contains the purest mass. It is then pumped into filter-presses, which extract the water, and line the sides with paste-like cakes. The clay is subjected to the same process. The graphite and clay cakes when dry are weighed in certain percentages and moistened in wooden vats, whence they go to the mixers. Very fine graphites are ground eighty to one hundred times, or more.

Afterwards the filter-presses again extract the moisture. When the mass has been completely dried, the pencil-sticks are made. Special machines pulverise the hard dry cakes, and the powder is so far moistened that the elastic paste can be let into steel cylinders, which are quite closed, but have a hole at the bottom formed with jewels. This hole is sometimes round, sometimes square, or has three or six sides, of course of the exact shape the inside lead pencil is intended to have. The graphite paste in the steel cylinders is subjected to pressure of about 20 atmospheres, and pushed through the jewelled holes at the bottom, where it comes out

like a string and falls in spirals on boards, where the workmen draw it out and straighten it, finally cutting it into the necessary lengths. The sticks in this state, when dry, are very brittle, and can only be made suitable for writing by burning or heating. This burning is a very important part of the process. Thirty or forty gross are placed into the graphite melting-pot, which must be perfectly air-tight, since in the open air the graphite would burn away. The pots are gradually heated in stoves, and remain there for several hours. When cold, they have acquired the necessary quality.

The cedar required for pencils is grown in America, and has special qualities fitting it for this manufacture. Other cedars are too hard, have too many knots, and do not possess a pleasant aroma. There is some suitable wood found in the Bermudas, but it is rare. The cedar coming from Florida is the best quality. The preparing of the cedar wood commences with sawing blocks of pencil length; these blocks are cut with circular-saws into boards of a width of four to six pencils. These boards have to be freed from resin, boiled, washed, and slowly dried. After the boards have been kept ready for some time and become thoroughly seasoned, they are placed into the "grooving machines." Each pencil has two halves, and in order to hold the graphite, the groove must correspond to exactly half the thickness of the "pencil lead." Now one-half of the board with the grooves is lightly coated with glue, and the leads are placed into the grooves, the corresponding board is put on the top and then placed into presses till the glue is quite dry. Then they go into "regulating machines," which polish the upper ends of the pencils. Now the boards (of six pencils each) are sent into the planing-room, where specially-constructed machines change them into round, square, hexagonal, or triangular pencils, the boards going in at one end of the machine and coming out as half-a-dozen finished pencils at the other. They have now to be sorted and sent to the polishers. After the polishing the ends of the pencils are cleaned and trimmed to exact length on special machines. They then go to the stamping department, are banded, and receive gold, silver, or aluminium stamps. The packing into dozens, and of so many dozens into a box, is done by women. From this room the pencils, which are now ready, go to the warehouse or to the forwarding department, whence they are despatched to all parts of the world. There are twenty-six pencil works in Bavaria, of which twenty-three are in Nuremberg and its immediate neighbourhood, employing from 8,000 to 10,000 workers, and producing 30,000 gross, or 4,320,000, lead and coloured chalk pencils per week, the firm of Johann Faber alone turning out an average of one million pencils per week.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

WEST WICKHAM, KENT.

THE last of the Architectural Association Summer Visits for this year took place on Saturday last, when a goodly number of members went in true summer weather to West Wickham, under the leadership of Mr. Owen Fleming. Reaching the village, Wickham Croft, where the late Mr. J. D. Sedding resided till his death, and a house designed by Mr. Norman Shaw, were noticed on the way to the chief object of the visit, the house known as Wickham Hall, work at which has been and still is being carried out by Mr. Walter Millard. The building was very fully described and illustrated in the *Builder* of November 10, 1894. Considerable interest was displayed in the clever way in which the architect has adapted numerous specimens of old work, and in the careful arrangement of cupboards and other internal fittings. Besides the house itself, an extensive range of stabling is now in course of construction.

After thoroughly seeing Wickham Hall, the party proceeded to the church of West Wickham, where, in the charmingly-situated churchyard, is the grave of the late J. D. Sedding and his wife. In the church is some of Sedding's work, the pulpit, seats, and choir stalls, as also the organ-chamber, being his design. There is not much else of interest in the church, except some rather good and well-preserved Flemish glass of late fifteenth or early sixteenth century date, but the general grouping and situation of the church are eminently picturesque, and suggestive of the quiet seclusion which is so often found to mark the rural Kentish church.

A short glance at the exterior of Wickham Court, which adjoins the church, completed the programme, and the party then walked ad Hayes Common to the railway station.

Illustrations.

ROMSEY ABBEY, HAMPSHIRE.

THE county of Hants, rich as it is in examples of early architecture, contains no better specimen of Norman work than the fine abbey church which we now illustrate. Founded in the year 900 by King Edward Elder, son of the celebrated King Alfred, and, others, by a Saxon nobleman Ethelwold, it is remarkable that there is hardly any verification of either of the above statements. Nor is the later history of the abbey the subject of record. In fact, the details are of the meagre description when the importance of the foundation and the extent of the buildings they formerly existed are considered. Records of the abbesses are extant; and the *Monasticon* has a fair list of their names. But there are few notices of the fabric, and none of the erection of the Norman church. Conjecture has endeavored to supply what history has failed to record, and good authority has suggested that it was the work of the Abbess Mary, the daughter of King Stephen, who, after disagreement with the monks of the Abbey of St. Leonard, at Stratford-le-Avo, removed with some of the nuns finally to Romsey. The belief is a plausible one, for the lady was wealthy, and there was doubtless building to be done. The circumstance that there is no record has been attributed to the fact that lady fell into trouble for daring to quit the cloister and to marry. The thunders of excommunication were hurled at her by Archbishop Becket, and would any good deed of hers be recorded? That? However, the architectural features of the earliest portion are too early, but part of the continuance of the work may reasonably be assigned to her period.

The fabric itself, like so many another of the most remarkable monuments, is its own history, and it tells it very well. Monastic records were perhaps, have been a help, but the architectural features of the edifice are so clear and distinct that the age of every portion can be ascertained with but little difficulty.

Of the first Saxon church, which may be supposed to have been an edifice of some importance, not a stone *in situ* remains all around. It has been completely swept away by the subsequent builders.

There is a large stone rood with the figure of the Saviour built into the west wall of the transept (formerly protected by the roof of the east walk of the cloisters) that is, most probably, a relic of the Saxon church, rebuilt into its present position. It is very similar in style to the Saxon carvings in the church of Bradford-on-Avon, and still more so to the Saxon Rood at Hildesheim. Worthy church not many miles away.

The Norman church presents a very characteristic plan, having many points of resemblance to that of Winchester Cathedral, notably the chapels at the ends of the aisles of the choir, which are semi-circular within and squared without. Reference to the plan will indicate that each transept has an apsidal chapel on the east face, and it may be concluded that the east end of the choir is an apsidal chapel beyond the retro-choir. Two arches of entrance remain, but the choir was rebuilt in the middle of the fourteenth century of larger dimensions, and with, most probably, a square ending.

The view from either side of the aisles at the retro-choir is of much architectural beauty, the solid effect of the Early Norman work and the heavy vaulting being very good.

While so many of our Early Norman minsters afford traces of semicircular endings, and while this feature is so pronounced elsewhere in the fabric, it is of interest to see that the east end of the choir was square in Norman times as now. The details of the workmanship form a valuable study of Early work, and they indicate that the rebuilding of the Saxon fabric began at the east end. The same archaic detail may be traced in the choir, aisles, and transepts, especially in their eastern walls. But beyond, to the west

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of "Romsey Abbey." The series (Kirkstall) will appear in the number published January 4, 1896. Particulars of the series will be found on p. xviii.



In the Choir, Romsey Abbey.



In the Nave, Romsey Abbey.

detail becomes lighter and more neatly finished, in the eastern portions the joints are wide the masonry not very well squared, the man characteristic tool-marks being visible in portion; in the western parts the bases are worked, the capitals more neatly formed, the joints are not so open. There is a good of Early carving on the caps of the eastern ones which deserves careful attention, from fact that it contrasts with much that has been at a little later period. The stonework in fact, gone over again by a later carver, much that had been left in the form of plain capitals was transferred into carving. Of work are the capitals with the name of Robert. "Robert me fecit," which has occasioned much ment, since it is supposed to be the name of architect of all the eastern parts. The nes of the earlier and plain capitals be made out very distinctly in several nces, on comparison with those which not been transformed by the carving, indeed, it will be found that the evidence of carving on earlier work is one of the most esting of the many curious features of the ling.

he zig-zag ornament occurs on several of the es of the eastern part, with, here and there, evidences that it, too, has been cut upon ously existing work. The occurrence of carving on earlier work is a subject that has et received the attention that it deserves. It be found to be more common than may at ight be supposed, and its non-observance not unfrequently caused a later date to be ed to Norman work than it merits. The doorway of Porchester church, Hants, is an ple of similar treatment. The date of the end is probably not later than 1120, although e portions of the clearstory may be a few s later. The four arches which support the y central tower are finely-proportioned, and a stately effect to the crossing.

he south transept has a great peculiarity. Its west wall is a large triplet of Norman dows, the central one being taller than the rs. The work does not line out with the h end, nor with the arch close to it of the h aisle of nave, and the triforium over it s is later work, and fair evidence of the ation of the progress for a time. The clear-

story all round the transept is level and uniform, a few years later than the bulk of the work. While the eastern end has fair uniformity of line, the work westward of the crossing is different, and the bold circular column on each side indicates a recommencement on a different design. It has often been compared, and with justice, to the peculiar Norman work at Oxford Cathedral, with the supposition that it is the work of the same architect. However, while parts of the side aisle walls were built, the progress westward came to a stop, and, as the plan indicates, the whole of the western part of the nave and its aisles is of a totally different design. It is Early English work of admirable proportion and sturdy design, the west front being very effective. The semi-circular arches and rectangular detail give place abruptly to pointed arches well moulded, and richer detail, of about 1190 or 1200. This being a nunnery church, there was no door at the west end for the admission of laity. There is no record of a parish church for the important town of Romsey, and none as to the admission of the townspeople. But in later times accommodation for them was provided in the north aisle, and parallel to this part was the fifteenth-century chapel of St. George, now demolished. Traces, however, exist incorporated with the Norman walling. These were until recently more visible, but they disappeared a few years ago in the injudicious attempt to restore the Norman aisle to its original design. Two bays—shown on the plan as Norman work—were thus treated, when the remainder of the work, fortunately, was abandoned.

The south-west view shows that the roofs in Norman times were of much higher pitch, while those of the aisles were high enough to conceal the arches of the triforium, which now appear above them. The present aspect of the east end over the retro-choir is also shown, with the two Norman arches filled in with geometrical traceried windows of the thirteenth century. The commencement of the Lady Chapel is also shown, with the arches of approach blocked by two windows, which we believe, came from some portion of the demolished building. The traces which remain at the junction are sufficient to shew the heights of the former work. The lantern on the Norman tower is modern, and it

may be supposed—since all the roofs were of high pitch springing from the existing corbel tables, possibly with a parapet—as to the later nave, that the original roof was of a slope to correspond.

The interior of the church presents a few traces of coloured decoration, and there are a good many monumental slabs, more or less broken. The best sepulchral monument is that of a lady, of fourteenth-century date, supposed for some time to have been the Abbess Mary already alluded to, who, however, died abroad. It is more likely to be, as supposed by the late Mr. Ashpitel, the effigy of the lady of Sir John le Rous, who granted large estates to the abbey in the time of Edward II.

A few traces of the monastic buildings are incorporated among the houses to the south of the church, and an archway of approach was removed recently. While the capacity of the buildings attest that this was a foundation for a large establishment, in proportion to its wealth, yet we find that the number of nuns was reduced to only twenty-three at the time of the Dissolution. The north-east angle of the north transept is pitted with bullet marks, traces of a skirmish which took place during the civil wars.

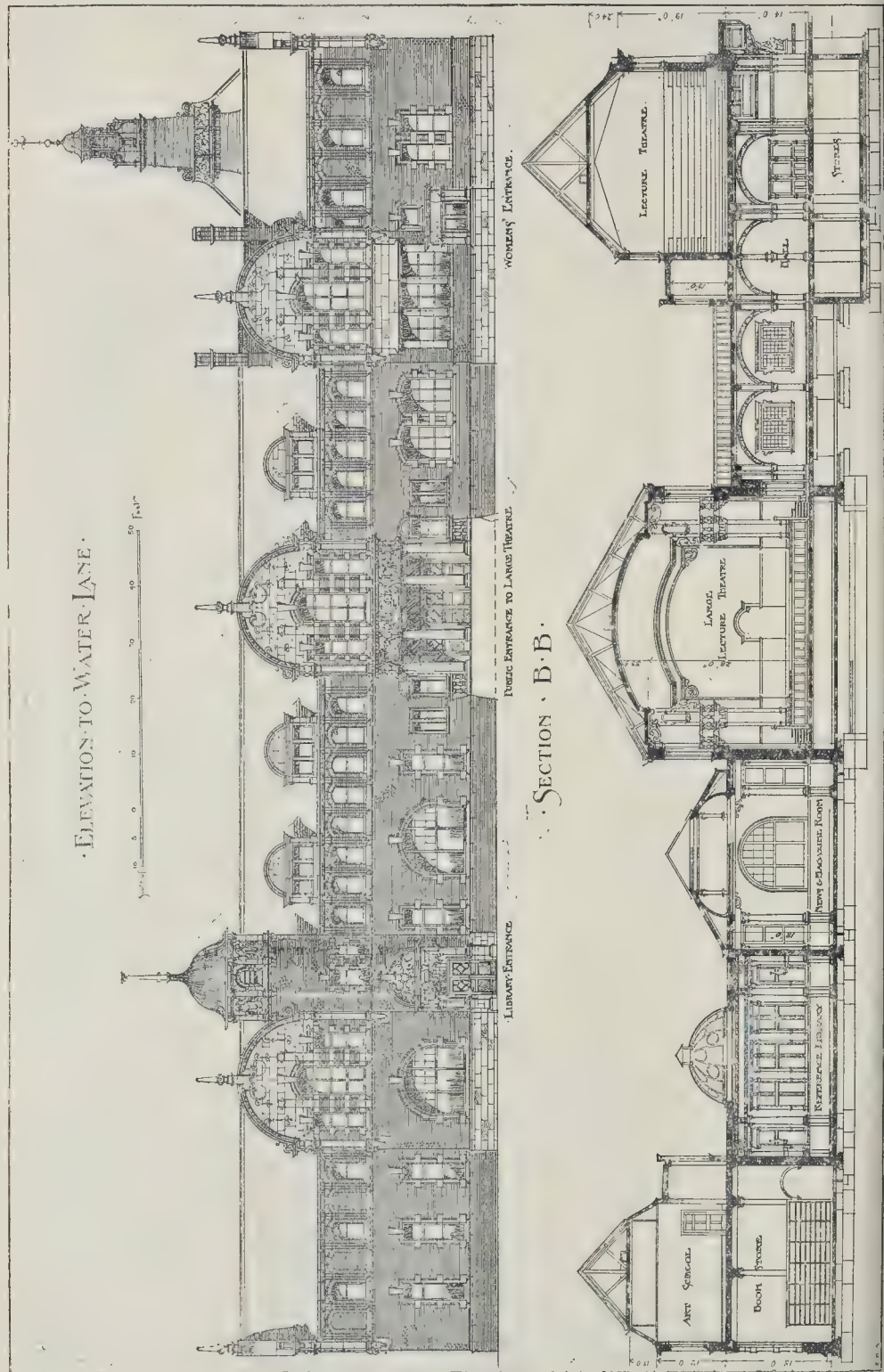
E. P. LOFTUS BROCK.

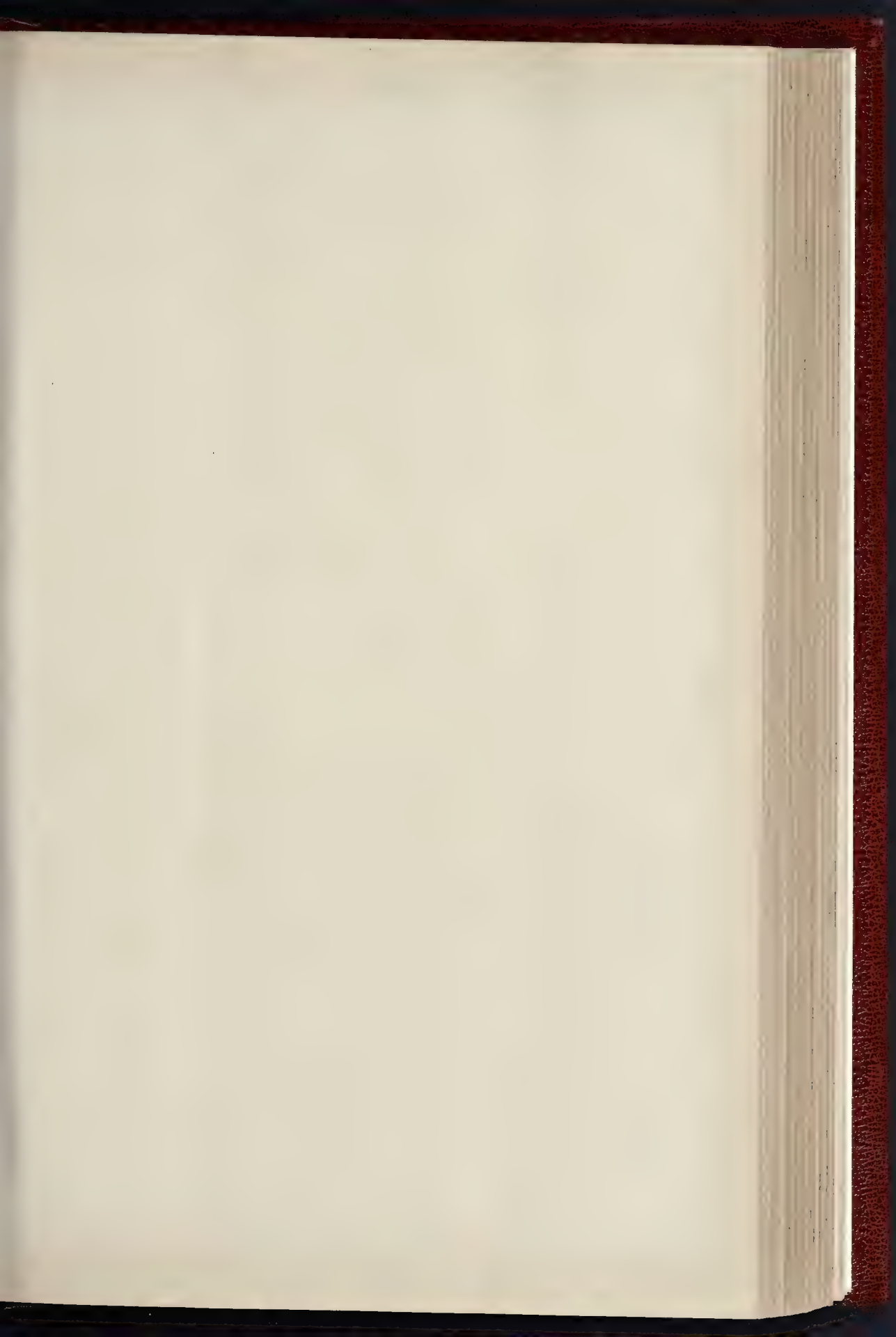
SELECTED DESIGN FOR WEST HAM TECHNICAL INSTITUTE AND PUBLIC LIBRARY.

We give in this number the principal drawings of the design by Messrs. Gibson & Russell, to which the first premium has been awarded, in the West Ham Technical Institute and Public Library competition, as mentioned in our last issue, and which will, we presume, be carried out. The illustrations include the general perspective view of the building, the plans of the two principal floors, the side elevation to Water-lane, the section of the building from back to front, and the detail elevation. The treatment of the principal front is sufficiently shown in the perspective view, so that the repetition of this portion of the design in elevation was hardly necessary.

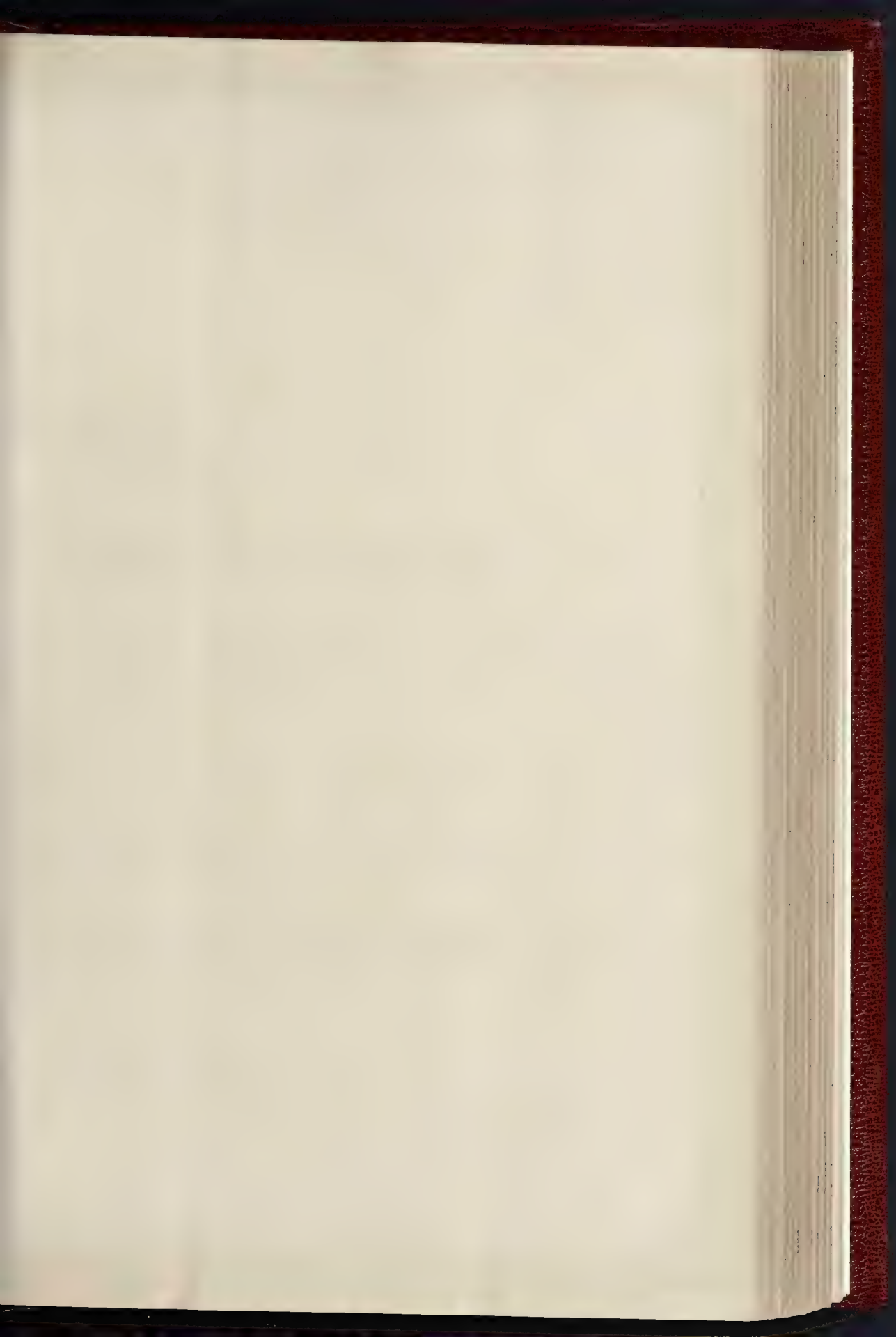
The following description of the intention of the design has been furnished to us by the architects:—

"In this design the principal accommodation is contained on two floors. The Public Library



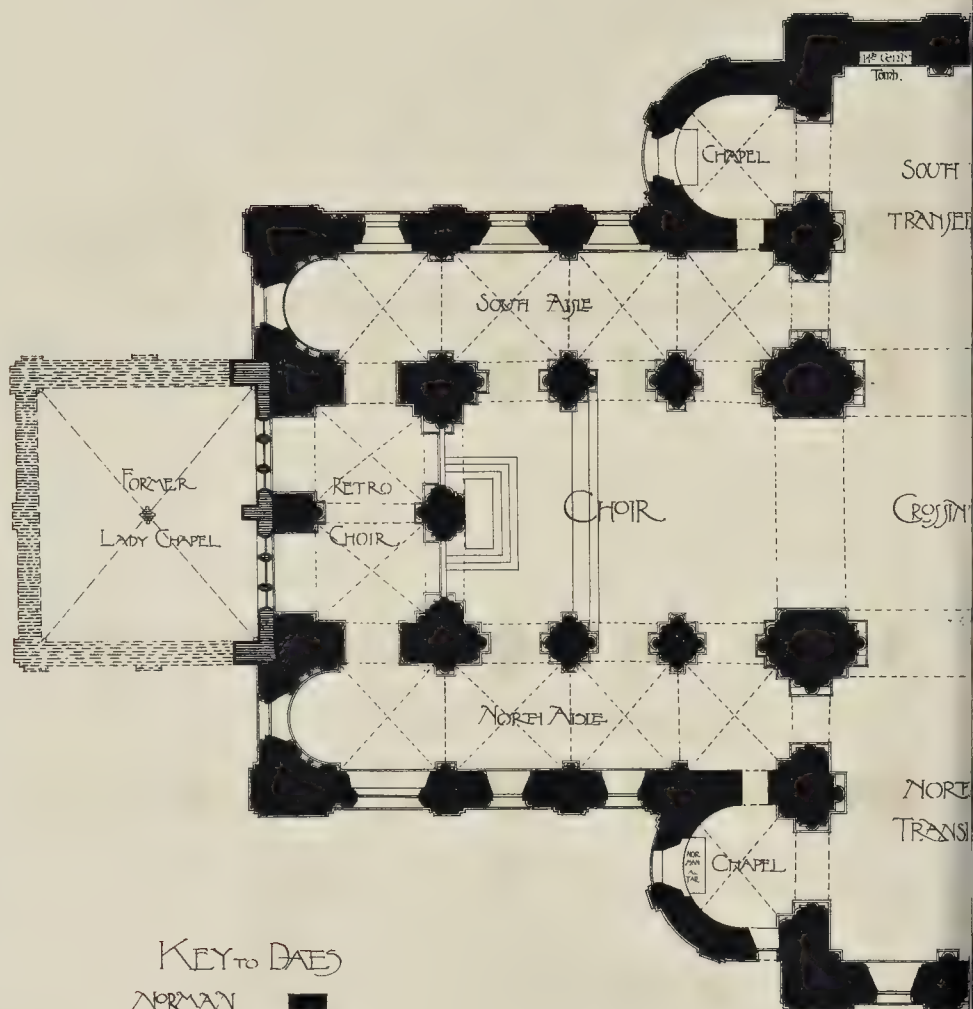










THE ABBEY CHURCH OF ROMSEY GROUND PLAN

Scale 



KEY TO DATES

NORMAN	
EARLY ENG	
DECORATED	
PERPENDICULAR	

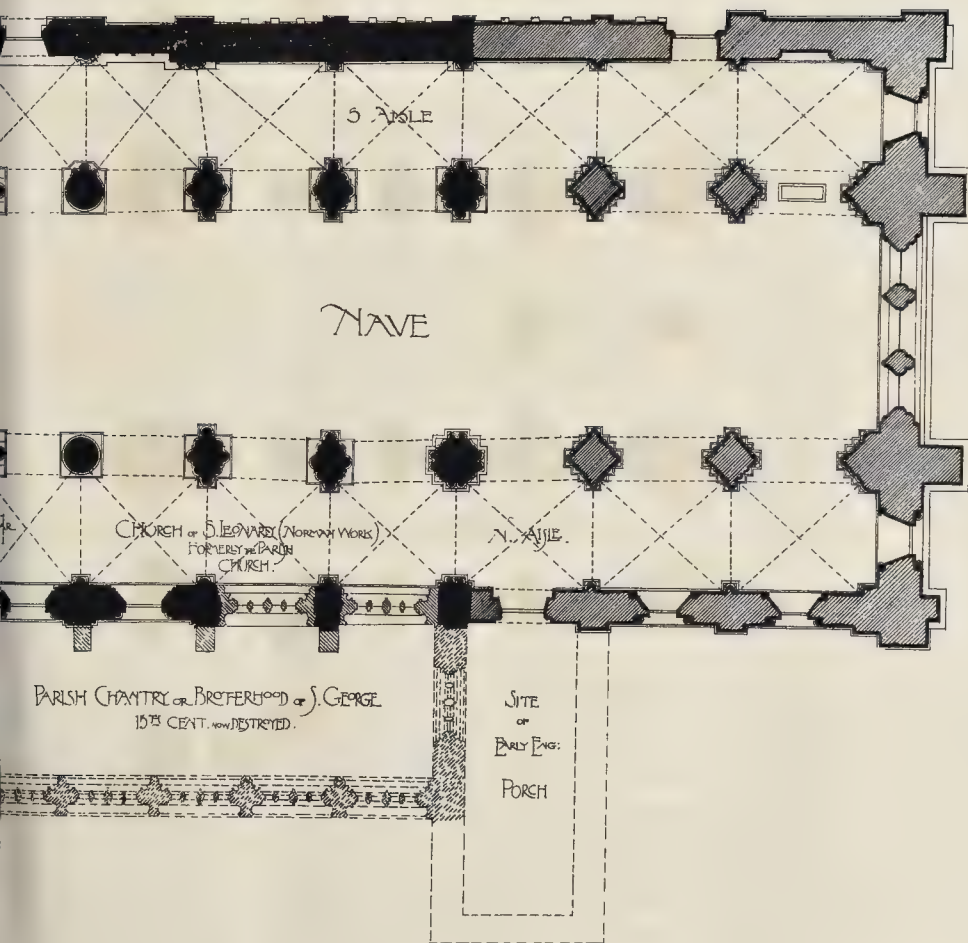
CEM. MONS.
ROMSEY
JUNE 95

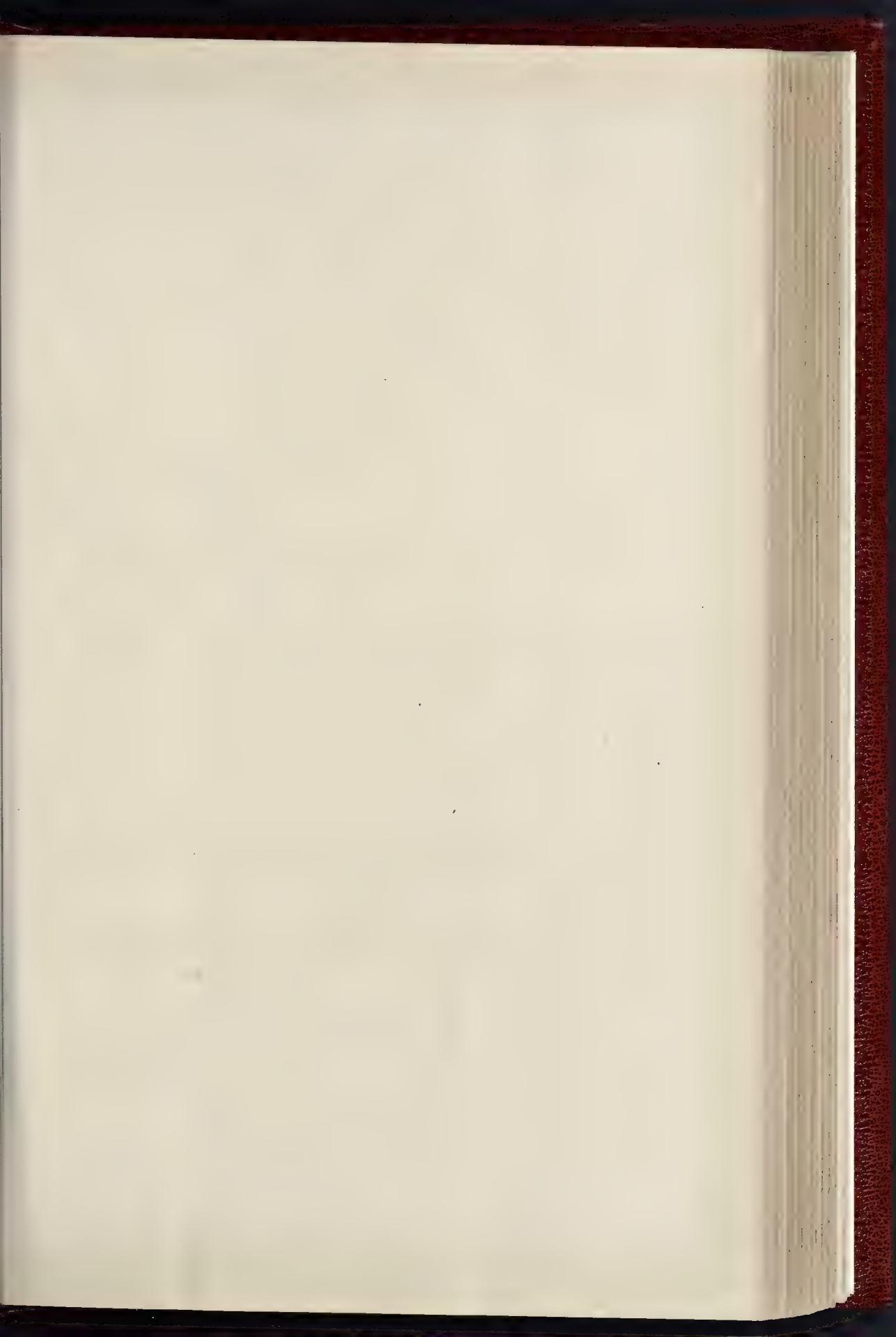
GOE. HERE
 & PROBABLY
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FORMER COMP. WAY TO CHAPLAIN

SITE OF CLOISTERS

THESE WERE ORIGINALLY 2 STOREY THE UPPER
 ONE OF WHICH WAS 12TH DEC. OR EARLY PERPENDICULAR.

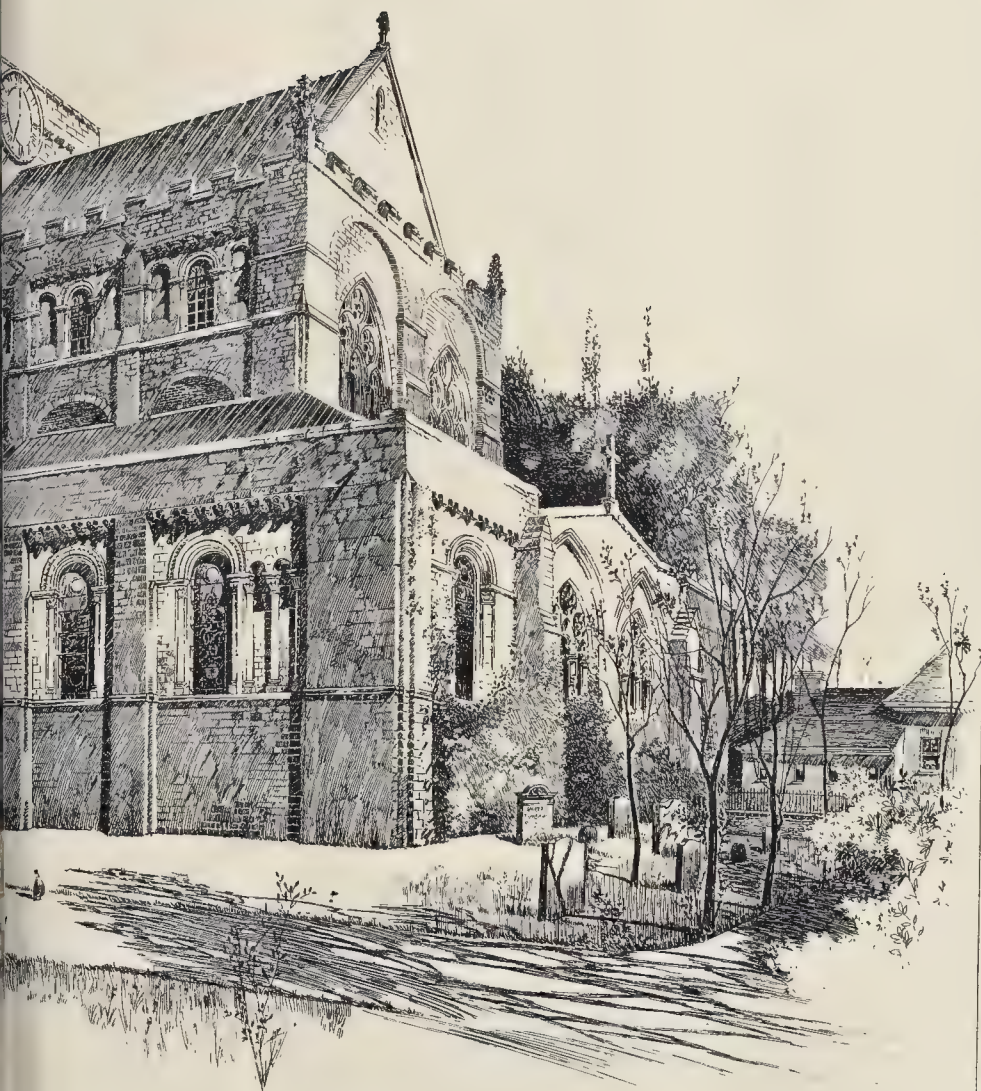




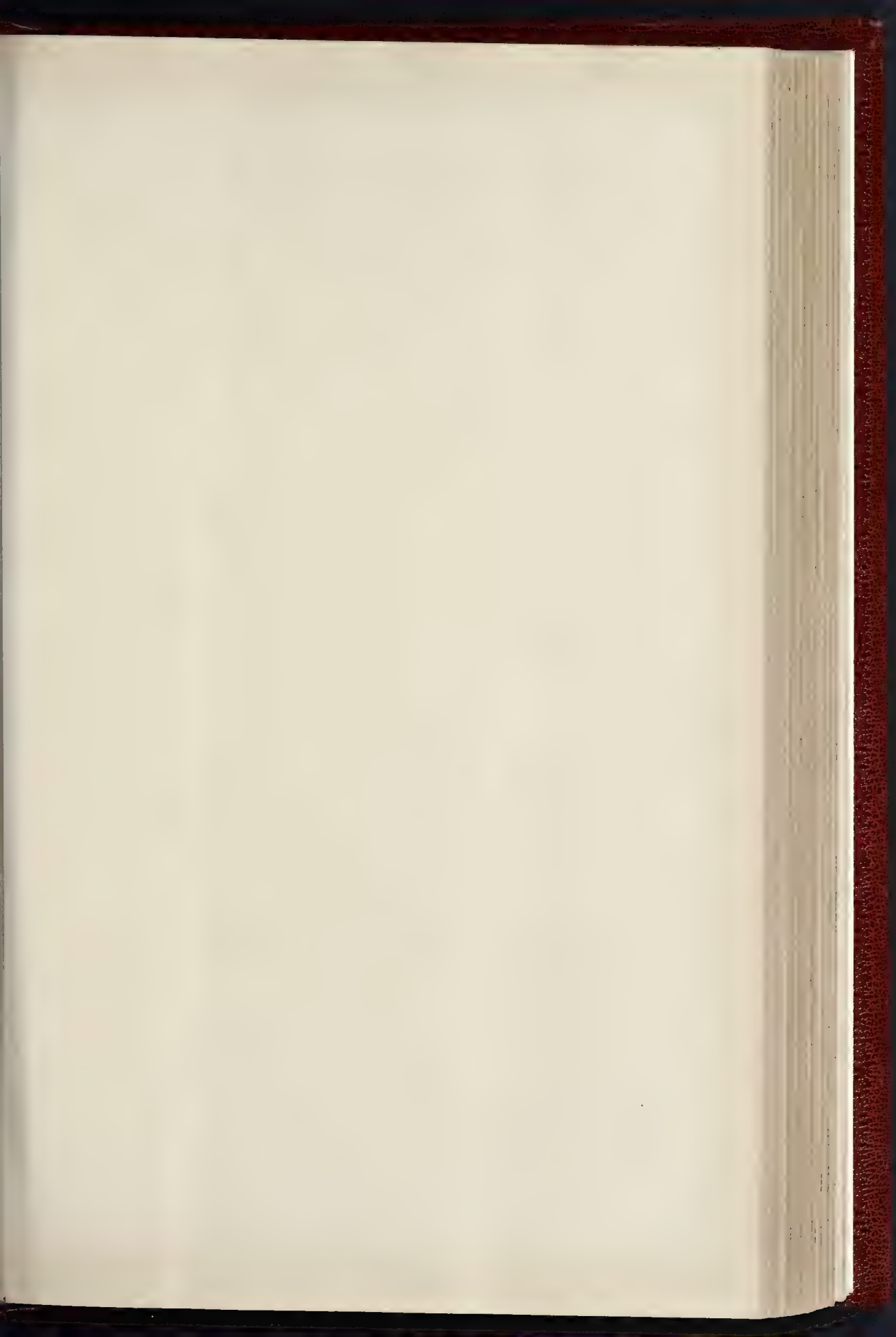


THE ABBEYS OF GREAT BRITAIN

DRAWN.

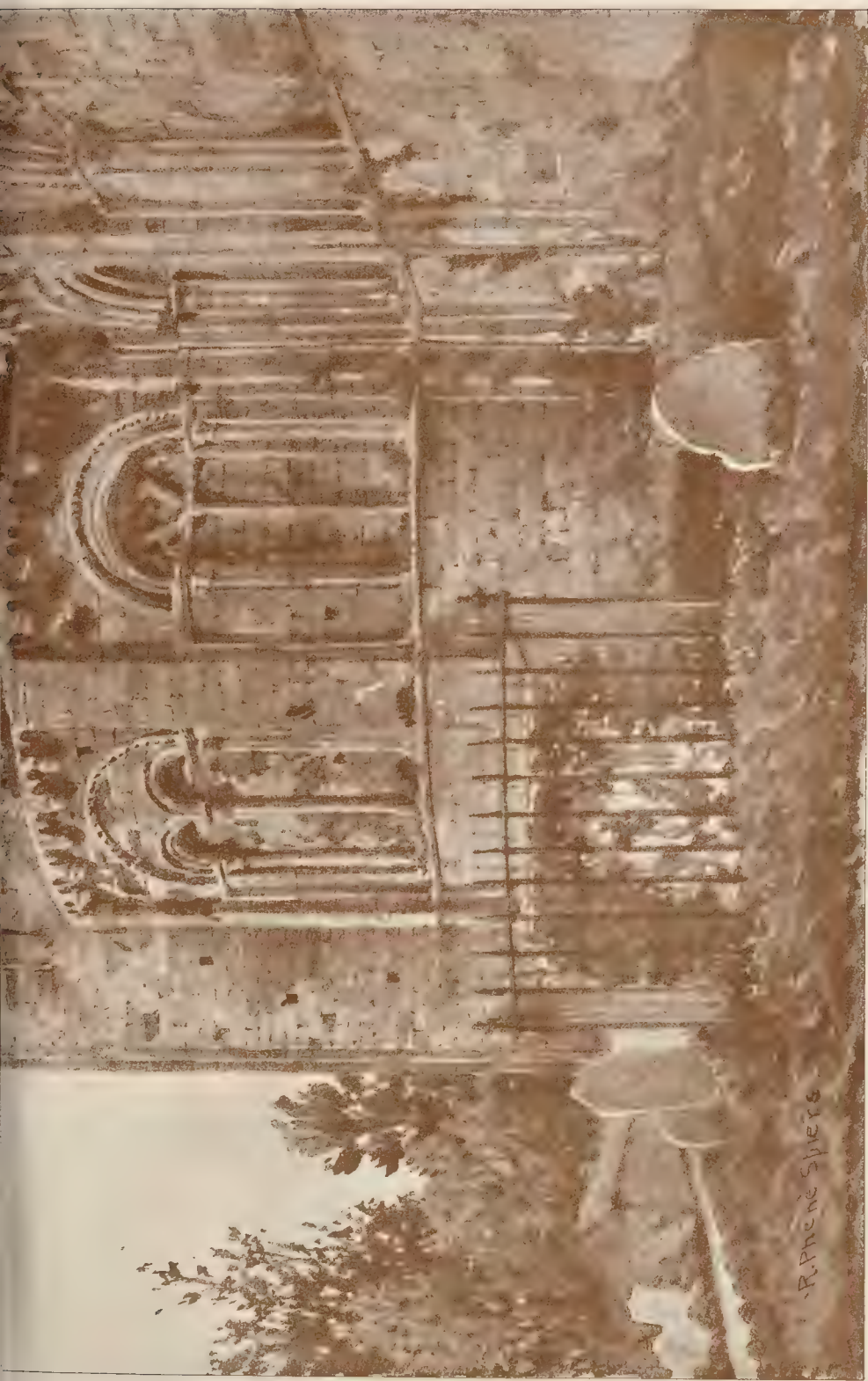


MSEY: FROM THE SOUTH-EAST.

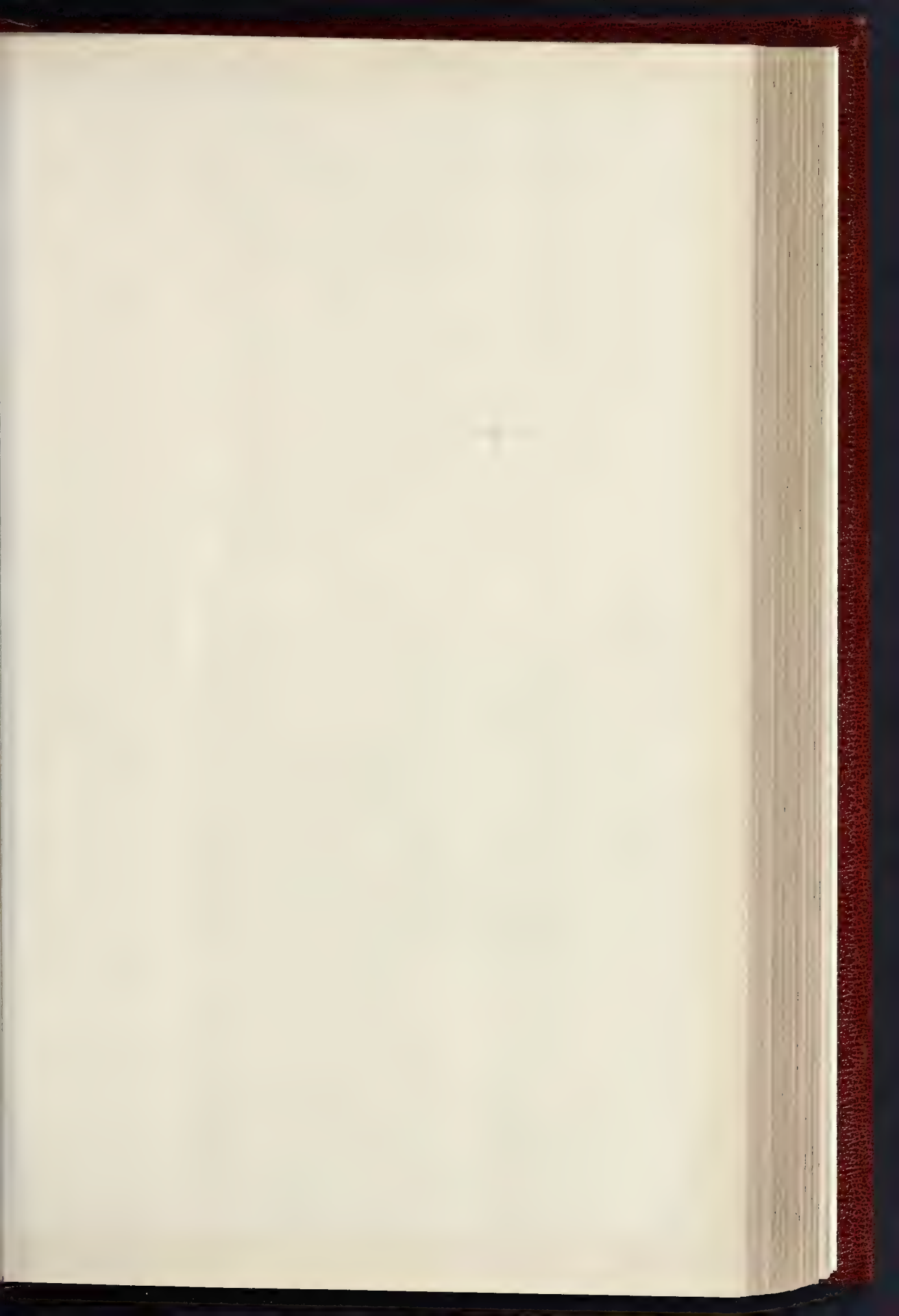


THE BUILDER. OCTOBER 5, 1895.





ROMSEY ABBEY THE ANGLE OF CHOIR AND SOUTH TRANSEPT FROM A DRAWING BY MR R. PHENÉ SPIERS, F.R.I.B.A.



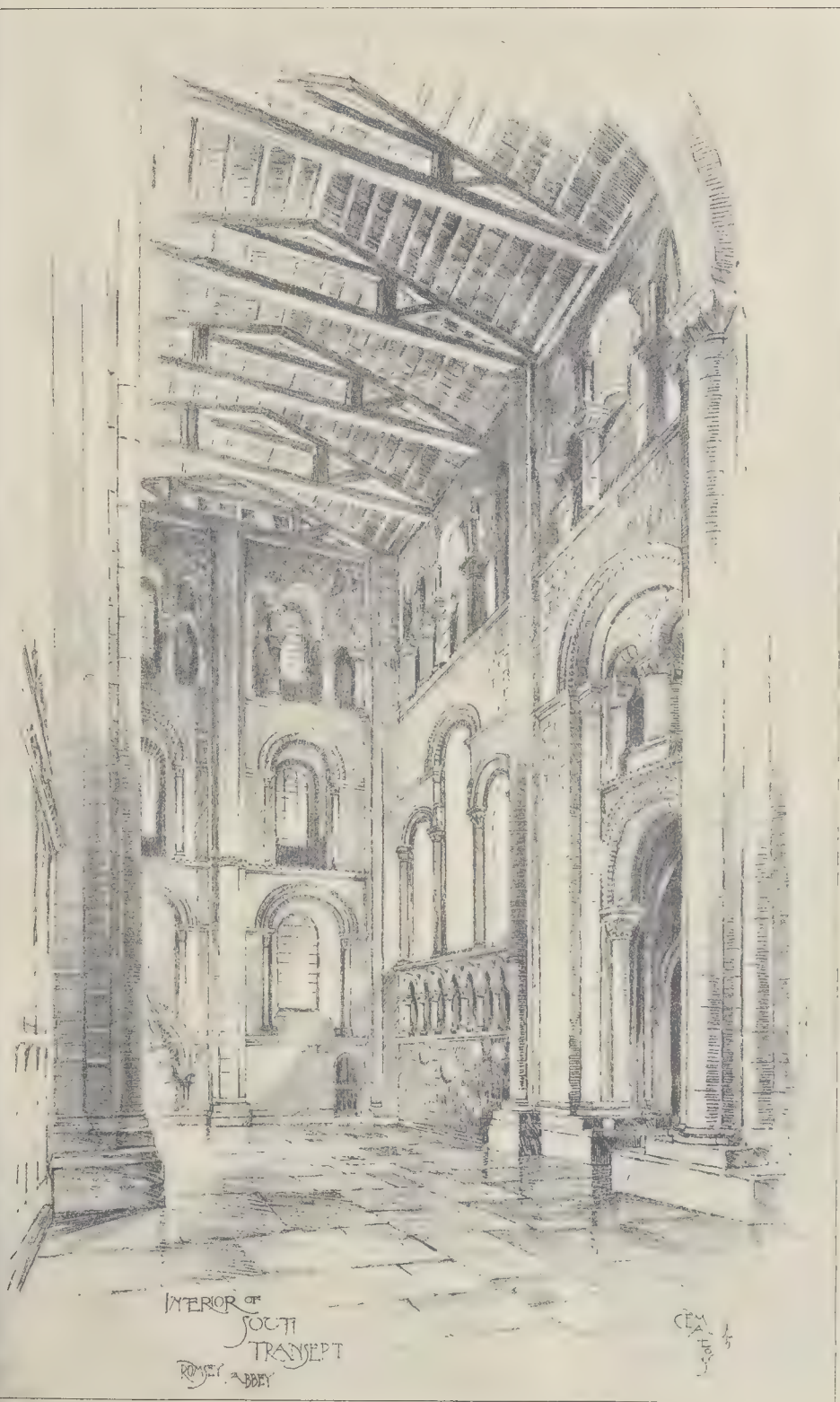


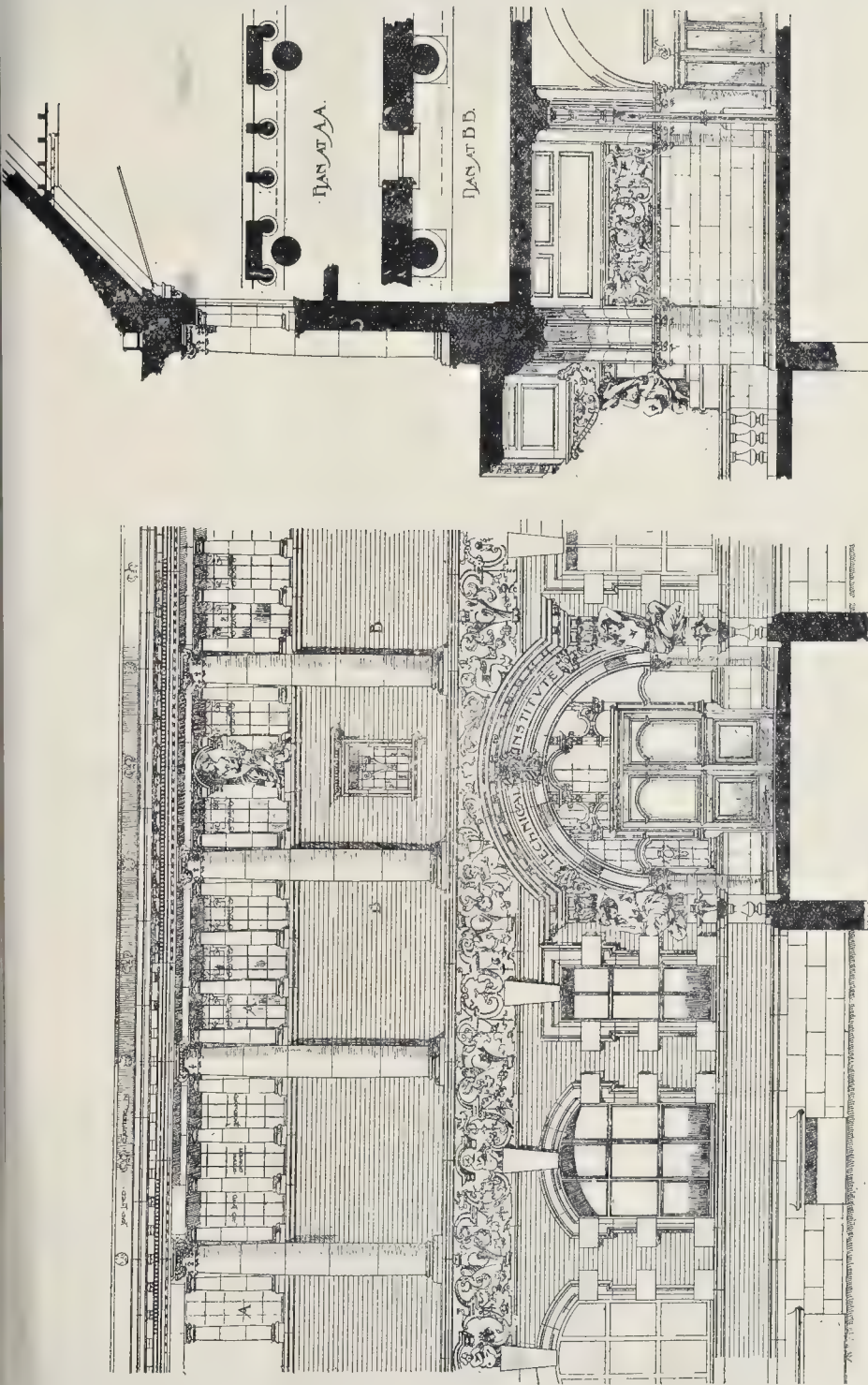
SELECTED DESIGN FOR WEST HAM TECHNICAL INSTITUTE AND



PHOTO BY H. S. B. 1895. HALLS, HIGH STREET, LONDON.

RY PERSPECTIVE VIEW—MESSRS. GIBSON & RUSSELL, ARCHITECTS

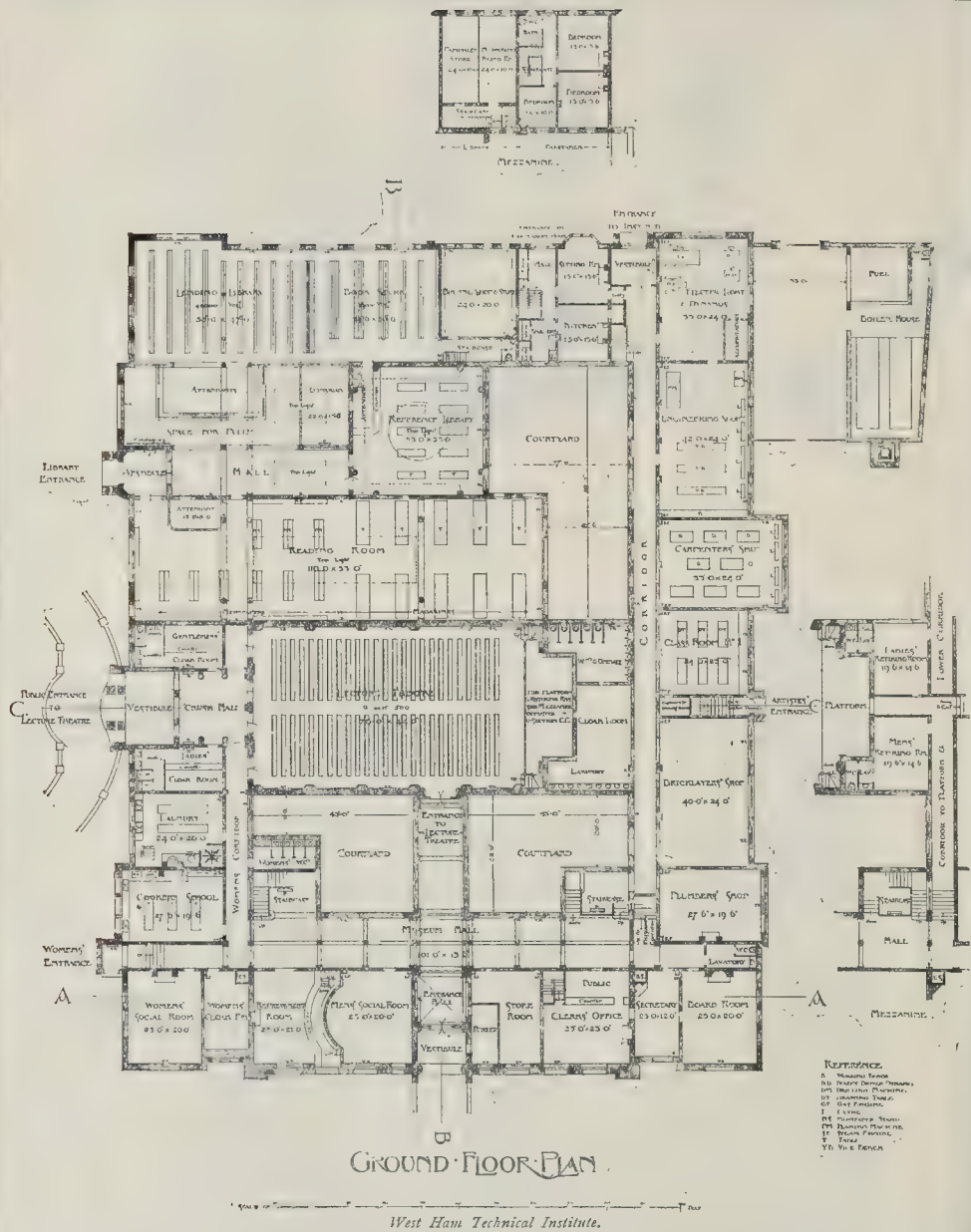




SECTION

PRINCIPAL ELEVATION

West Ham Technical Institute and Public Library: Messrs. Gibson & Russell, Architects.—Detail Elevation.



is incorporated with the main building, and is placed on the ground-floor at the north-west end. By this means a largely-increased area is obtained on the upper floor, where the principal working portion of the Institute is advantageously placed.

The principal entrance to the Institute faces Romford-road, and gives access to a colonnaded hall, suitable for the display of examples of the students' work. Off this hall, and facing Romford-road, are placed the secretary's and other offices, as well as the social and refreshment rooms.

Two staircases, one at each end of the hall, lead to the first floor.

The workshops occupy the eastern side on the ground level, and the rooms have a height of 18 ft. The boiler-house forms a separate block outside the building.

The rooms for women's work face Water-lane, and are provided with a separate entrance, which appears customary in London, though not in the Provinces.

The large Lecture Theatre, to seat 500 persons,

has its principal entrance, with cloak-rooms, &c., facing Water-lane, and is so arranged that it can be used for entertainments without interfering with the work of the Institute.

Retiring-rooms for performers are provided at the level of the platform at the further end of the hall, and communicate directly with the outside as well as with the principal hall in the front. A short, wide corridor leads direct from the principal entrance in Romford-road to the side of the hall, and will serve as an additional exit.

The Public Library contains all the accommodation desired, arranged in a convenient manner, with the Reading-rooms, retired from noise, and ample space for the public in the lending department.

The Art School occupies the north front on the first floor, the laboratories, &c., the east, and various class-rooms the west; and the two smaller Lecture Theatres are placed end to end facing Romford-road, with their doors at the heads of the two principal staircases.

It is proposed to construct the building of fire-resisting materials, with the walls faced externally with red brick and stone dressings, and the roofs tiled.

In designing the exterior the aim has been to group the various parts together to form a whole which will be pleasing in effect and express clearly the purpose of the building, and the detail suggested is such as would give interest and refinement when worked out.

We congratulate the architects on a legitimate and well-earned success.

HYGIENIC VENTILATION.

The following is an abstract of a paper on this subject read before the Manchester Society of Architects by Mr. John Le Marchant Bishop, on Tuesday evening, October 1:-

Ventilation is a purely hygienic matter, and can only be dealt with upon hygienic principles.

The laws of hygiene require that mankind shall at all times breathe pure fresh air, under conditions of immunity from the noxious influences of draughts and variations of temperature. Here we have at once the true object of ventilation and the true standard for ventilation schemes. None of the schemes as yet in vogue in this country approach this standard, and most of them fail egregiously. The chief causes of this general failure may be classified as follows:—

1. *Misconceptions concerning*—
 - (a) The nature, scope, and objects of ventilation, and
 - (b) The various scientific and other conditions to be dealt with. Hence
2. *Practical errors*, such as—
 - (a) Inadequacy and inappropriateness of the means and appliances employed;
 - (b) Want of precision in their design and construction, or execution;
 - (c) Absence of system, or logical relation, in their various proportions, adjustments, and arrangements.

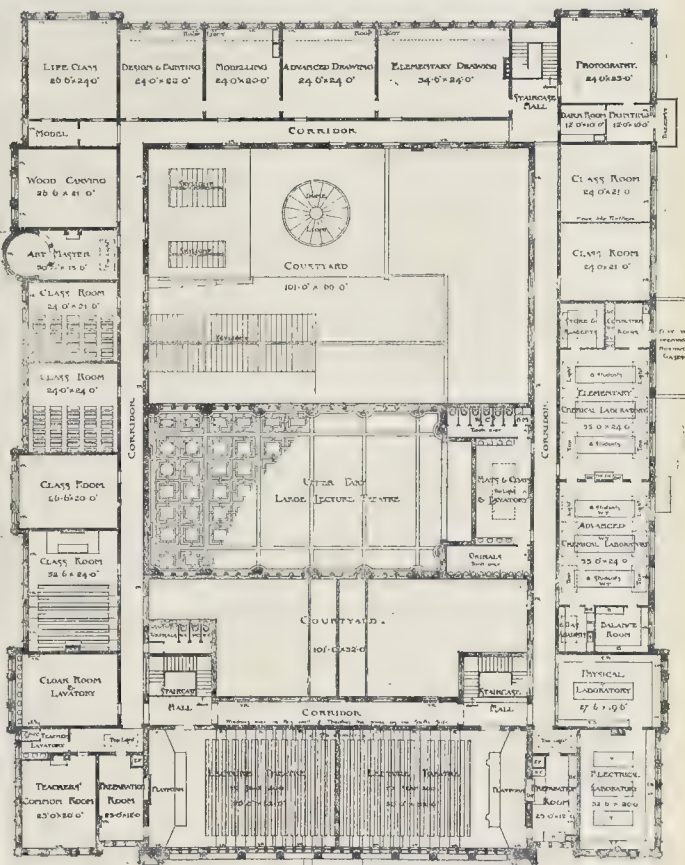
In a word, rule-of-thumb, blind speculation, and empiricism have hitherto been paramount in a sphere wherein the practical embodiment of philosophic thought, following upon adequate scientific knowledge, could alone be reasonably expected to succeed. The very frequent practice of diverting the fresh currents away from the persons of the occupants of a room, in order to protect them from draughts, thus rendering impossible the acquisition of pure air by those to whom it is essential, and for whose sole benefit it is introduced, often at considerable cost, is typical of a numerous class of practical errors common to both mechanical and automatic schemes.

It must be accepted as a cardinal principle that true hygienic ventilation is impossible without a free, direct, and practically continuous circulation of pure fresh air through all parts of the air space. This, in an occupied room, would of necessity involve the thorough diffusion of the air, and its complete and uniform distribution in the diffused condition. Since, however, its diffusion from below would be at once an intolerable nuisance and hygienically pernicious to the occupants, it must necessarily be diffused from above, and brought to them in its diffused form. This, again, would necessitate its extraction from below, namely, at the floor line, in order to avert its resumption of the current form, about the persons of the occupants.

The mere extraction from below, however, would effect neither the diffusion nor the distribution of the incoming air. Only by means of a carefully and judiciously-devised system of inlets and outlets, freely and uniformly distributed about the room, having definite relation to each other in point of areas, numbers, and situations to the plan and dimensions of the room and to the numbers of persons assembled, with other appliances and accessories, affording complete control of the admitted currents—a system, in short, devised upon strictly philosophical principles, and executed with mechanical precision—could this be effectually ensured. In such a case not only would draughts be impossible, but the whole of the admitted air pressed into actual service would mingle freely amongst the occupants, instead of escaping from the room above their heads; while the exhalations, participating in the general downward sweep, would be immediately drawn towards the outlets and carried away by the exhaust.

There is nothing chimerical or utopian in this, unless the substitution of the guiding principles of science and philosophy for rule-of-thumb, speculation, and haphazard be such. Upon the principles herein suggested, effectual ventilation, whether by the mechanical or the automatic process, would become an accomplished fact, and more real and effective work would thus be automatically obtainable than either process could yield upon the usual methods. Not only would less power be needed in mechanical ventilation, but a combination of the two processes in one effective system, hitherto impracticable, would then be practicable, whereby the operation of power, indispensable during the periods of assembly, could be suspended during the intervals of recess without interruption to the continuity of the circulation of fresh air, so essential to the purity and healthfulness of all enclosed places of assembly.

ASSISTANT-SURVEYORSHIP, MARGATE. — For the position of Assistant-Surveyor to the Borough of Margate there were ten candidates. Each application was considered at a Council meeting held on the 1st inst., with the result that Mr. Frank Latbam, A.E., was appointed.



FIRST FLOOR PLAN

West Ham Technical Institute.

Books.

A Digest of the Law of Easements. By J. C. INNES, late of the Indian Civil Service, and some time one of the Judges of the High Court of Judicature, Madras. Fifth Edition. London: 1895.

WHEN a book has reached a fifth edition any observations upon it by a reviewer may be regarded as somewhat perfunctory, since it is clear that the book would not have run through so many editions did it not answer to some public want. We are not surprised at the favour with which the book has been received, since, in a clear and brief form, it states the law of easement. There are few branches of law which in our artificial state of society are of more importance than this, since it contains the law in regard to ways, to light, to air, to water, and to the support of buildings. We confess when we examine the work that a regret arises that those who are responsible for our legal legislation do not adopt this book as the foundation for a code on this branch of law. It would be a great public service if the law, for example, as to light and as to support, were enacted in a compact and scientific form, so that ordinary laymen could consult such a code as a banker does the Bills of Exchange Act. There is one question as regards this

book that may be fairly asked: the publishers are good enough to mark it as being sold for 7s. 6d. Mr. Innes, in his preface, states the book was undertaken not only as a preliminary to some public codification of this branch of the law, but for the use of the public and the legal profession. But such a price as the above for a little book of 125 pages is far too high, and prevents it from being as widely used as it might be.

Note-book on Plane Geometrical Drawing, with a Chapter on Scales, and an Introduction to Graphic Statics. By ROBERT HARRIS. London: Geo. Bell & Sons. 1895. New edition, revised and enlarged.

THIS book was produced by the author, who is art-master at St. Paul's School, mainly for the use of students preparing for the entrance examinations at Woolwich and Sandhurst. It is an eminently practical book, the principal portion consisting of a series of brief explanations of practical problems in geometry, accompanied by diagrams. The construction of scales is explained in a separate chapter, and chapters are devoted to the drawing of geometrical patterns and to graphic statics. To each section of the book are attached a number of "examples" in the form of problems to be worked out. As a practical book on the subject, for young students, it is likely to be very useful.

SIR,—A little misunderstanding seems to exist with regard to the letter published by "A Builder's Clerk," September 21, 1895. In that letter he asks why an institution could not be started and upheld for the benefit of reliable and competent clerks, men who have been through the mill and thoroughly understand what is required of them (he does not use these exact words, but this is what he means).

I think such an institution ought to be started and kept up by all good men by an annual subscription, and be such a place that builders could apply for and obtain men who could assist them and study their interest for a fair and equitable return. I am quite prepared to join "A Builder's Clerk" in trying to form such an institution for the benefits of the trade. I enclose my name and address.

"A LONDON ESTIMATING CLERK."

The Student's Column.

METALS USED IN BUILDING.—XIV.

ALLOYS.—THE IRON GROUP.

THE metals usually included in what metallurgists call the "iron group" are iron, manganese, cobalt, nickel, and chromium. They have several features in common, notably their protoxides form powerful bases, whilst certain oxides of the first two and the last-mentioned metals form metallic acids which tend to combine with bases to form salts soluble in water. Further, steam is decomposed on being brought into contact with either of the metals of the iron group at a red heat.

Iron.—We have, already alluded (p. 34 ante) to the principal ores from which iron is extracted. The metal is capable of assuming the form either of (1) malleable iron, (2) cast-iron, or (3) steel, according to its method of treatment. It is extracted from its ores in the form of cast-iron, when it is melted with facility, and it may yield castings which are easily tooled and finished, or, in the other hand, it may be made so hard as to render it next to impossible for tools to make any impression. With careful handling, under treatment with air and heat, the cast-iron may be made into steel; and continued a little further, with slight modifications of the same treatment, the steel may be converted into malleable iron, which, whilst soft enough to be easily tooled, possesses great strength and tenacity.

Iron and Manganese.—Possibly none of the alloys of manganese is of more importance than that with iron. Ferromanganese can be made in the blast-furnace with the resulting metal containing above 90 per cent. of manganese; but such a large proportion of the last-mentioned metal is not desirable, as it is apt to render the whole weak. Eighty per cent. may be described as the practical limit to which the manganese may be permitted to attain in ferromanganese. The reduction of manganese oxide in presence of iron may seem at first sight to be a fortunate circumstance in view of the valuable alloys formed, but it must be remembered that the richer the alloy in manganese, the more of that undesirable element, carbon, is present.

According to Mr. Vosmer,* the percentage of carbon taken up by divers alloys of iron and manganese is as follows:—

Pig-iron.....	10 to 20 p.c. mang.,	50 p.c. carb.
Ferromanganese.....	35 "	5.5 "
Do.....	50 "	6.5 "
Do.....	65 "	6.5 "
Do.....	80 "	7.0 "
Do.....	90 "	7.3 "

The richer brands of ferromanganese, as may be anticipated by the foregoing, are those in which *per se* the percentage of carbon per unit of manganese is lowest. It frequently happens that, through the manganese ore containing phosphorus to an appreciable extent, the alloy has to be prepared accordingly. Thus, the phosphorus will do less harm in a very rich manganese pig than in one of a lower grade in the manufacture of steel, from the circumstance that much less of the former is used, and consequently less phosphorus finds its way into the steel.

Unless intended for chilled castings, foundry pig-iron should not contain manganese, but if the iron is also fairly rich in silicon it may not matter. The greater the percentage of manganese in such pig the more silicon and carbon must be present in order that the casting may turn out well. If the particular pig does not contain all the desired attributes to make a clean and soft casting, two or more are mixed together, and it has been very

aptly remarked that a precise knowledge of the constitution of divers pigs enables the manufacturer who is a practised metallurgist to produce better castings in every way than his neighbour who works merely by rule-of-thumb. But if it has its disadvantages in pig-iron, manganese, by preventing carbon and silicon from oxidising, leads to the establishment of a metal which will stand re-melting oftener than where the manganese constituent is wanting—a circumstance of much importance in the practical manipulation of pig-iron. It has been shown that, whereas ferromanganese with from 10 to 20 per cent. of manganese assumes a specular structure (especially well brought out by reflected light under the microscope), irons richer in that metal have the crystals developed as needles instead of scales.

Turning now to other forms of iron with manganese, it may be remarked, with reference to cast-iron, that as the manganese tends to keep the carbon in an intimately divided, or, perhaps, a combined state, the resulting metal will be white in the absence of a fair proportion of silicon. In general terms it increases the crushing strength, hardness, and fluidity of cast-iron. The proportion of manganese in wrought-iron is always so exceedingly small that it may safely be said to have no appreciable effect on that metal as a whole.

The most important uses of manganese in our present connection, however, is for the manufacture of steel. It is safe to say that nearly all steel contains it in a greater or less degree. Amongst its other beneficial properties, it renders the steel more elastic, whilst it does not impart brittleness when judiciously employed. In regard to its strengthening attributes, we shall allude to them hereafter. We may only say now, that of two steels having the same ultimate strength, manganese steel will have larger elongation than carbon steel, provided the manganese is present in certain minute proportions, hence manganese may be advantageously employed in structural steel where both strength and ductility are required. In the manufacture of ordinary steel the affinity of manganese for oxygen causes a reduction of the oxides existing in the bath of material under treatment. The consequent oxidation and slagging of the manganese leaves the metal de-oxidised and otherwise improved. The fiery effect of oxygen, or other gases, absorbed by the decarbonised iron almost instantaneously disappears, and the influence of manganese during the further stages of forging and rolling is quite as beneficial, enabling the steel to be worked and reduced to required shapes.

A remarkable addition to our knowledge of the metallurgy of steel and manganese has been made in recent years by Mr. R. A. Hadfield. The most noticeable characteristics of "Hadfield manganese-steel," as it is termed, are its peculiar hardness combined with great toughness; also the effect of water on the metal, and its general electrical properties. In a communication to the Institution of Civil Engineers,* that author, referring to the property of hardness, stated that it is scarcely possible to machine any of divers specimens of this steel on a practical scale. The hardness varies considerably in degree, being most intense in the cast material, containing from 5 to 6 per cent. of manganese, and with only 0.3 to 0.5 per cent. carbon, an alloy which no tool will face or touch. On more manganese being added a gradual decrease in hardness is observable, and when about 10 per cent. is reached it has arrived at the point of maximum softness. With a further addition, the alloy becomes harder, and at 22 per cent. it is very hard, but not so much so as at the 5 per cent. stage. After passing 22 per cent. the material begins to take on the character of cast-iron rather than steel, though it possesses a greater transverse strength than cast-iron. Owing to the peculiar hardness of this class of steel its general application to castings has been limited by the difficulty of machining them. Within the last few years, however, considerable improvements have been made in that direction, but the applications have necessarily for the most part been confined to castings where the runners could be broken off cold, or pared bot. As an instance of the perfect action of the manganese it may be remarked that in chemically analysing samples of this steel no trace of graphite has been discovered, all the carbon present being in the combined form or in an extremely intimate condition.

It has been stated that Hadfield manganese steel is not in reality steel, but an alloy in

certain proportions of iron and metallic manganese, containing also carbon. This is perfectly true if we restrict the term "steel" to a metal composed essentially of iron and carbon; but one of the greatest authorities on steel, M. Bresson, has demonstrated the convenience of considering that metal as "a particular state of iron produced by its union with bodies the nature of which can vary. There are three classes:—1st, steels composed of iron and carbon; 2nd, those of iron, carbon, and a third body; 3rd, those formed of iron, and another body which is not carbon." In other words, it is recognised that bodies other than carbon can play a constituent part in the conversion of iron into steel, manganese amongst them; and this is the view generally adopted at the present day.

On this manganese steel being plunged into water it is ascertained that no hardening action takes place as in ordinary carbon-steel, but the metal is rendered tougher, though not in the same sense as with carbon-steel. The increase in stiffness is most marked, and, according to experiments made by Mr. Hadfield, the tensile strength rises from 40 to 60, and in some cases even to 70, tons per square inch; but whereas in all carbon-steel the rise is invariably accompanied (when the cooling medium is water) by a considerable decrease in ductility or elongation, in the manganese steel just the opposite effect is produced. After a large number of tests with regard to the action of heat and sudden cooling upon the last-mentioned metal, it was ascertained that the greater the heat of the piece treated, and the more sudden and rapid the cooling, the higher will be the breaking-load, and the greater the toughness or elongation.

The structure of manganese-steel varies with the amount of manganese present, as already foreshadowed in our remarks on pig-iron. In brittle specimens, containing from 3 to 7.5 per cent. of manganese if the piece has been cast in an ingot mould, say 4 in. square, there will be found to the depth of about 1½ in. needles, or prismatic crystals of similar form to those noticeable to the naked eye in tougher specimens. In the centre, where the cooling has proceeded more slowly, there is a heterogeneous mass of crystals which break with a peculiar fracture, the hardness being as intense in the centre as on the outside. When the steel contains from 8 to 12 per cent. of manganese the structure somewhat resembles that of scalded steel, but, unlike the latter, re-heating, even to a high degree, will not perceptibly change the character assumed by the crystals, which is only accomplished by forging. The fracture shows little needles or fibres collected in bundles formed at right-angles to the point of contact with the mould and scattered all over the face; these are hard, very tough, and bend almost like copper. When more than 12 per cent. of manganese is present acicular crystals are not so prominently developed, and they disappear entirely to the naked eye as the proportion of manganese is slightly increased. The fracture then appears more like that of coarse cast-iron, but with large crystals. Passing this point, nothing definite is known concerning the structure of the metal, beyond that the crystals are very irregularly distributed, and the whole arrangement becomes very much complicated. In view of the great importance assumed by manganese steel, and, indeed, steel alloys generally, it is remarkable that so little attention has hitherto been paid to questions concerning the intimate structure of the metals. As was pointed out some years ago by Mr. Bayles, "The key to the mystery," so far as certain properties of steel are concerned, "seems to lie in the structure of the metal; and until more concerning this is known it is not safe to rely solely upon analyses and tests. No doubt, if our knowledge in this direction were sufficiently advanced, an explanation might be found for some of the unaccountable failures which have occurred with steel, and where neither analyses nor mechanical tests have afforded any light. Chemical analysis does not satisfactorily explain the difference between a piece of hardened and unhardened carbon-steel from the same bar."

Mild steel, such as is used in constructional work, often contains from 0.3 to 0.4 per cent. manganese; at the Forth Bridge the percentage was 0.7 for much of the material used. Amongst many other things manganese steel is especially adapted for haulage ropes, for bed-plates and frames of dynamos, and in the form of wire on resistance boards.

* "Encyclopédie Chimique," article "Aciers." Paris, 1886, p. 2.
 † "Trans. Amer. Inst. Mining Engineers," vol. xiii, 1884, p. 26.

* "The Mechanical and Other Properties of Iron and Steel," 1891, page 36.

* "Min. Proc. Inst. C.E.," vol. xciii, (1893), pp. 17, et seq.

OBITUARY.

MR. HENRY SMITH.—We regret to announce the death of Mr. Henry Smith, of 8, John-street, Adelphi, who was well known as an efficient and trustworthy practitioner in Quantity Surveying. Mr. Smith was the son of a builder at Nottingham, but came to London at the age of twenty-one and entered the service of Messrs. Myers & Sons, and was their measuring clerk till 1874, when the firm gave up business. From that date he practised as a Quantity Surveyor on his own account, and was largely employed in connexion with the Royal Free Hospital, the Portsmouth R.C. Cathedral, the Oratory at Brompton, St. Joseph's College, Tooting, and other extensive buildings. In his business Mr. Smith had the highest reputation for integrity, ability, and thoroughness.

GENERAL BUILDING NEWS.

EMPIRE PALACE OF VARIETIES, SHEFFIELD.—This building in Pinstone-street, which is rapidly approaching completion, will, it is anticipated, be opened at the end of this month. The façade in Charles-street is of red brick and stone, and copper-covered cupolas have been erected at either end. Above the principal entrance, figures emblematic of Music and Art are introduced. Accommodation is provided inside for nearly 3,500 spectators; there are two circles and two galleries, with several lounge-rooms. Messrs. Longden & Son, of Neepsend, are the contractors; the architect being Mr. Frank Matcham, of London.

NEW SCHOOL.—At Westbury Leigh, Wilts, a new school has been built from the designs of Mr. Wm. White, who also built the church there some eighteen years ago. The cost has been about £500. The building is of local limestone random work, with dressings and special mouldings of red brick, which is also used inside for the dado and some other parts. Roofs are covered with red Shropshire tiles, and the floors are laid with wood blocks. The warming is by open grates, slow combustion, specially constructed.

RESTORATION OF "OAK HOUSE," WEST BROMWICH.—We understand that this well-known example of ancient domestic architecture, which has recently been acquired by the Mayor of West Bromwich and presented by him to the town as a museum and art gallery, is now to be thoroughly restored at the expense of the donor. Mr. W. H. Kendrick, of the firm of Messrs. Wood & Kendrick, architects, has prepared a plan for the complete restoration of the building, which has been duly approved. The lantern is to have a studied restoration; the buttress is to be removed from the east gable, and all the substructure rebuilt as originally designed. The boarding now covering the south gable is to be replaced with oak framing, with plaster filling. The modern windows are to be removed, those at present filled in to be opened out, and the whole of them replaced on original lines. All large deal boards are to be substituted by oak, and defective brickwork is to be cut out and replaced with bricks of the same character, the bonding and mortar to be finished to agree with the old style of work. In the interior all oak panelling now painted is to have the paint removed, and all superfluous modern work is to be banished. The museum, or galleries, will occupy the reception-rooms on the ground floor, whilst the present kitchen and larder will be devoted to the use of the caretaker. The boundary-wall next Oak-road is to be taken down, and a suitable iron fencing erected. A sweeping approach will be made from the road. Part of the grounds will be laid out as a lawn or greenward, bordered by a shrubbery, forming a wild, old-fashioned garden, in keeping with the ancient building. It is estimated that the total cost of the restoration will be about 2,000l.

NEW SCHOOL BUILDINGS, WOLVERHAMPTON.—The foundation-stone of the school-buildings to be erected in connexion with St. Mark's Church, Wolverhampton, was laid on the 26th ult. The builder is Mr. H. Gough, and the architect, Mr. J. Lavender, of that city.

NEW INFIRMARY, HELENSBURGH, N.B.—The infirmary recently erected at Helensburgh was opened on the 27th ult. The building consists of a central pavilion of two stories with high-pitched roof, flanked by two octagonal oriel windows with bell-shaped roof. The main wards, both for males and females, of one story, run east and west. The mortuary occupies an isolated block, while the disinfecting chamber is entirely shut off, and entered from the outside only. The front elevation is of red and white freestone, and the roofs are covered with green slates, finished with red tile ridges. Mr. Leiper, of Helensburgh, was the architect.

NEW THEATRE FOR EAST LONDON.—The new building, to be called the "Borough Theatre," in Stratford High-street, is being rapidly proceeded with, and will, it is anticipated, be ready for occupation early next year. We understand that it will be the second largest theatre in London. The *East London Advertiser* states that there will be seating accommodation for 3,000 people, with entrances and exits in Stratford High-street, Bridge-road, and Bridge-terrace. It will be lighted throughout by electricity, and emergency exits are very numerous. It is expected that the cost of the new theatre will not be less than 20,000l. Elaborate arrangements will be made for furnishing and upholstering. The

seats are to be arranged on a new principle, and the stage will be as large as that of Drury Lane. The contractors are Messrs. Perry & Co., of Bow, and the architect Mr. Frank Matcham, of Warwick-court, E.C.

SAILORS' HOME, ABERDEEN.—The home for sailors recently erected at Aberdeen, for the directors of the Sailors' Institute, was opened on the 27th ult. The building consists of three blocks, one with frontage to Mearns-street, another to James-street, and a centre block. The whole of the front is of dressed Kinnaird granite. The dining-room is 37 ft. long by 17 ft. wide, opening from which is a large lounge-room and smoke-room. The first-floor is devoted to the mission purposes of the Institute. The chapel is capable of holding 150, and is lighted by stained-glass windows. Occupying the whole of the central block is a hall, to be used as a Sunday-school and for the larger meetings, which will seat about 350. On the second-floor is the navigation school and class-rooms and sleeping apartments for officers and sailors resident in the Home. On the upper floor is a sailors' "cabin," intended to house in one chamber a shipwrecked crew, and there are three apartments, or "forecabin," for the same purpose. The buildings have cost about 3,000l. The architect was Mr. James Souttar, of Aberdeen.

THEATRE, BARNSTAPLE.—After extensive alterations, of such a character as to render the building practically a new edifice, the old theatre at Barnstaple has been opened to the public. The structural alterations made have consisted in the raising of the seating accommodation; the pit has been lowered to the street level, and a "griddon" about 40 ft. in height erected. Messrs. Sanders & Ridge were the contractors, and the architect was Mr. F. W. Petter, of Barnstaple.

PARK HALL, WARRINGTON.—On the 26th ult. the hall, which was presented to the Warrington Corporation by the Park Hall Trust, was opened. The building stands on the south side of Palmyra-square, close to the gymnasium. The *Liverpool Daily Post* states that it is 108 ft. by 64 ft. 6 in. inside, exclusive of an organ-chamber 30 ft. by 16 ft. The body of the hall on the ground-floor is 95 ft. by 45 ft. 6 in., which is surrounded on all four sides by corridors 6 ft., 7 ft., and 10 ft. wide respectively, to prevent draughts. On the gallery-floor at the west end there are front and back galleries; whilst at the sides of the hall there are galleries 13 ft. wide. These latter, by covering the corridors on the ground-floor, project over the body of the hall about 5 ft. only. The gallery has three exits, two of which are staircases, with two landings on each. From the ground-floor there are eight means of exit. The platform has a width of 7 ft., with a rising tier of steps behind for the accommodation of the choir. It is reached from the private corridor by stairs on either side, the organ-chamber being situated immediately behind it. The hall is fitted to accommodate about 1,500 people, but for political and other crowded meetings it could be made to seat 2,000. The building was designed by Mr. William Owen, of Cairo-street Chambers, and the contractor was Mr. R. W. Collin. The painting was executed by Messrs. Hesketh & Sons; and the heating by John King, Limited, of Liverpool.

NEW WESLEYAN CHURCH, KEW.—The memorial stones of the Wesleyan church now being erected in Cambridge-road, Kew, were laid the other day in presence of a numerous company. The building will consist of a Sunday-school, minister's vestry, heating chamber and offices on the basement floor, with the chapel over. The dimensions are about 43 ft. long by 23 ft. 6 in. wide, exclusive of the space occupied by the porch and organ-chamber. The schoolroom is provided in the chapel, and the schoolroom will hold about 100 children. Separate entrances and porches are arranged for the boys and girls respectively. There is also a private entrance and porch at the back, communicating with the minister's vestry and schoolroom, and with the chapel, by means of a small staircase, which may be used by the congregation as an exit if required. The schoolroom being beneath, the floor of the chapel is some height above the ground, and the difference in levels has been made up by a short flight of stone steps outside the entrance and a few further steps inside the porch. The style is Early Decorated. The front elevation will consist of a gable, containing a three-light stone tracery window, which will be the principal feature of the front. Under this window is the entrance-porch and doorway, the latter being flanked by angular buttresses. The brickwork to the front is to be relieved with Bath stone dressings to the window, entrance doorway, buttress slopes, coping, plinth, &c. Internally the chapel will be divided into four bays by strong-framed semi-circular piers, resting on Bath stone corbels. Each bay will contain a two-light Gothic-headed window. The roof will show as panelled woodwork, the purlins being visible and covered with boarding. Along the centre of the ceiling a perforated open panel will be placed for ventilation. The windows to the chapel will be glazed with lead glazing of light tints, and of simple design. Boundary-walls are to be built on three sides of the site, that to the front containing two gates, and having stone plinth and coping and pier caps. Messrs. G. F. Bates & Son, of Barnes and Ashford, are the contractors; and Mr. R. Curwen, of 168-9, Palmerston-buildings, E.C., is the architect.

ADDITIONS TO THE GRAND HOTEL, BIRMINGHAM.—A portion of the extensive additions recently made to the Grand Hotel, Birmingham, are now ready for occupation. The additions consist of a new block of buildings fronting Warwick-street, containing ten stories of rooms including basement and sub-basement, of two stories to about half the range of the building fronting to Church-street, the provision of new offices in Colmore-row, and of two extra billiard-rooms under the shops facing Colmore-row. But the principal feature of the work is the erection of a large hall or banqueting-room, 100 ft. in length and 32 ft. high, with an annex intended as a lounge. This hall is elaborately decorated, the floor is of polished oak, with spiral springs, and set on concrete. In front of the gallery for the orchestra is an ornamental screen of hammered brass and copper. Adjoining the hall is a drawing room furnished and decorated in the Louis XVI style, with richly-painted ceiling and amber silk paneling. There is also a crush hall with ornamental ceiling and walls in panels of embossed and gilt leather, with a dado of Ashburnton and Ogwell marble. It is estimated that the whole of the additions will cost from 60,000l. to 70,000l. The contractors are Messrs. J. Barnsley & Sons, Birmingham. Messrs. Rosser & Russell, of Birmingham and London have carried out the engineering work under the direction of Mr. Ormitt Halpin, of Westminster. The wells and boring have been executed by Messrs. Isler & Co., London; Messrs. Waygood & Co., of London supplied materials, and Messrs. Winton Hollins, & Co. of Stoke-on-Trent, the tile-factory of walls. The architects are Messrs. Martin & Chamberlain, of Birmingham.

CHURCH EXTENSION, SPARKHILL, BIRMINGHAM.—An extensive addition to St. John's Church, Sparkhill, was consecrated by the Bishop of Coventry last week. It comprises accommodation for 250 persons, at a cost of about 2,500l. The architects were Messrs. Martin & Chamberlain, of Colmore-row, Birmingham.

PROPOSED CHAPEL, NORTHAMPTON.—At a recent meeting held in Northampton on the occasion of the bi-centenary of the opening of Doddridge Chapel, it was resolved that a new chapel, together with school buildings, should be erected at St. James' End, in addition to the renovation of the present building. The estimated cost is 3,000l. Plans have already been prepared.

NEW MASONIC TEMPLE, CARDIFF.—The buildings to be known as the Masonic Temple, Cardiff, and which was formerly used as a place of worship, were opened on the 25th ult., in the presence of a large gathering of masons, and a striking feature of the new edifice is the swinging doors, which admit of access to a long corridor extending the length of the building. These are panelled with cathedral glass bearing five Masonic emblems. Branching off the corridor are cloak-rooms and other offices. At the head of the staircase, situated at the end of the corridor, is a lesser lodge-room, furnished with the appointments of the old hall. At the back of the building is a large banqueting-hall, capable of accommodating 100 guests, and a large kitchen adjoins. Outside the lodge-room are two robing-rooms. The temple itself has been elaborately decorated. The furnishing is of an expensive character. There are seven large chairs, each of a different pattern, thirty-four "Past Masters' chairs" of a distinctive pattern, and fifty "Junior Masters' chairs." There are also two benches seating four each, and three benches seating three each. All these are of Austrian crown oak, and are upholstered with crimson mohair velvet of English make. The Master's chair is elaborately carved, and bears the arms and motto of the donor, Lord Llangatwg. The gallery, in which the organ is placed, is capable of seating 140 people. The chief columns are 14 ft. high, and are Corinthian and Doric in style. The ceiling has been ornamented with Masonic symbols and emblems. The lodge-room is 58 ft. long by 40 ft. wide and 30 ft. high. The side walls have eight long windows, with plaster-moulded arches and moulded heads placed to them, with ornamented string-course to the walls in between. Behind the Senior Warden's chair there is a projecting gallery, with curved windows, supported on carved brackets. The dado is very conspicuous, being 10 ft. high, of panelled work divided by pilasters, and having a moulded entablature above, the two ends being treated differently to the sides. The ceiling of the gallery is of plaster, and is upholstered, it is stated, will be between 7,000l. and 8,000l. Messrs. E. R. Evans & Bros., of Cardiff, were the contractors, and Mr. Geo. Thomas, of the same city, architect.

SCHOOL BUILDINGS, NEWPORT, BARNSTAPLE.—New school buildings were opened at Newport, Barnstaple, on Wednesday the 25th ult., to accommodate 150 children. It is part of a general scheme to extend the school accommodation of the town in order to prevent the introduction of Board Schools. The material used is local stone, with polished red deal fittings. The site has cost £150, the building £650. In addition to the main room, there is a class-room, and a large modesty room. G. C. Smyth-Richards was the honorary architect.

TECHNICAL INSTITUTE, RICHMOND.—The new Secondary Schools and Technical Institute at Richmond, S.W. (the foundation-stone of which was recently laid by the Duke of Cambridge), is now

an advanced stage. The fire-proof floors are of Messrs. Homan & Rodgers' system. The architects are Messrs. Fryer & Bath, whose design was selected in public competition, and the builder is Mr. J. W. Brooking, of Richmond.

THE QUEEN VICTORIA NURSING INSTITUTION, WOLVERHAMPTON.—This building has been erected at the corner of the Bath and Albany-roads, having a frontage of 70 ft. towards the former and 63 ft. towards the latter, the elevations being of red brick with stone and terra-cotta dressings. It provides accommodation for thirteen nurses, each having a private sleeping cubicle on the upper floors, with a day-room, box or luggage-room, with lift, on the ground floor. There are also two suites of apartments for private patients, with bedrooms for attendants, on the first floor, together with matron's room and sewing-room. On the ground floor are large entrance hall, office, matron's sitting-room, board-room, together with spacious kitchens and domestic offices. Ample provision is made on each floor for baths, closets, lavatories, and other accommodation required in a building of this description. The whole of the works have been carried out by Messrs. H. Wilcock & Co., contractors, of Wolverhampton, for the sum of 3,862*l.*, under the superintendence and from designs by Messrs. J. R. Veall & Son, architects, also of Wolverhampton.

LUCOMB CHINE, ISLE OF WIGHT.—At a meeting of the Justices of the Peace for the Isle of Wight, held at Newport last Saturday, a provisional licence was granted for a hotel to be erected at Lucombe Chine, near Shanklin, in accordance with designs prepared by Mr. W. Oldham Chambers, architect, of London, at a cost of 17,500*l.* The hotel will consist of a spacious *salle-à-manger*, drawing-room, saloon, library, and writing-room, smoking-room, billiard-room, fifty-eight bedrooms, bath-rooms, &c. There will be an installation of electric light throughout.

NEW RESIDENTIAL FLATS, LONDON.—A block of residential flats are in course of erection at the corner of Luxembourg-gardens, Brook-green, Hampstead, and the Mansions. The building is fireproof in construction, and is fitted with all the latest improvements, both sanitary and domestic. Each flat is self-contained, with services, mosaic floors to halls and corridors, and the outlook is upon the ornamental gardens. The top story is planned for bachelor's suites and studios, with uninterrupted north light. The cost will be 100,000*l.* The architects are Messrs. Fryer & Bath, of Westminster and Richmond.

WATER SUPPLY, BIRMINGHAM.

WATER SUPPLY, BIRMINGHAM.—The *Birmingham Daily Gazette* states that the Water Committee of the Birmingham Corporation reports that the engineering and office arrangements submitted by the Committee in their last report to the Council, and approved, have now been brought into operation. The analysis of the water supplied in the middle level being found early in the summer to be satisfactory, it became evident to the Committee that the means of filtration at Aston were no longer efficient for dealing with the demand. They accordingly undertook the thorough renovation of the Aston filter-beds. One of these has been completed and the other is in progress. The cost of renewing the filter-beds is estimated at 2,250*l.* The filtered water pools at Aston have also been emptied and cleansed, at a cost of 250*l.* During the summer months the resources of the department have been strained to the utmost to keep pace with the demand in the various districts, and considerable inconvenience to consumers has been caused at times. With their existing works the Committee cannot distribute larger quantities of water, and in order of pressure it is absolutely necessary that strict economy should be practised. Under the head of "Elan Valley Works," the Committee reports that during the summer months considerable progress has been made with the excavation in the upper part of the valley has been completed as far as the site of the Pen-y-gareg dam, and is being continued to the Craig Goch dam. Workshops and offices in connexion with the works at Pen-y-gareg have been erected, and a commencement has been made with the excavation of the foundation of the dam itself and the necessary river diversion. A start has also been made with the excavation at the submerged dam near Crag-ddu. The number of men employed on the works in the Elan Valley was, in September, 1,003. By the Act of 1892, the provisions of the Railway Clauses Consolidation Act of 1845, with respect to the temporary occupation of lands during the construction of works (including the use of land for the deposit of spoil), are applied only to railways and reservoirs authorised by Bill, as originally drafted and deposited to Parliament, extended the application of the Railway Clauses Act to the aqueduct, but this provision was struck out at the instance of the Lords Chairman of Committees, in accordance with a practice recently introduced by his Lordship. It has, consequently, been necessary to endeavour to acquire by agreement the sites required for the deposit of spoil from the aqueduct works. For the whole of the length already let, and for other sections, spoil

sites have been acquired on terms more or less reasonable; but with regard to an important section now under negotiation, the prices asked by the owners of all the suitable sites are, in the opinion of the Committee, so excessive, that they are unable to authorise their agents to acquire the lands on the terms named. Spoil sites are absolutely necessary for the carrying out of the works authorised by the Act of 1892, and the Committee are advised that little difficulty is likely to be experienced in obtaining Parliamentary powers for the compulsory acquisition of definite sites, to be scheduled and indicated on plans to be deposited. The Committee therefore recommends that application be made to Parliament, in the ensuing Session, for an Act giving compulsory powers for the purchase or use of the necessary lands. For the construction of the reservoir, filter-beds, and other works at Frankley, a large quantity of stone, cement, and other materials will have to be conveyed from Rubery station. Under existing circumstances, these would have to be carted over hilly country roads at heavy expense. In the application to Parliament it is proposed to ask for powers to construct a short railway from Rubery station to the property of the Corporation at Frankley, as the cost of conveyance by rail, even taking into consideration the cost of making the railway, will effect a saving as compared with cartage. The railway will be about a mile in length, and will pass wholly over the property of one landowner. Sanction will also be asked for a slight deviation in the line of the aqueduct at Park Attwood, which has been rendered advisable, in consequence of circumstances which have arisen since the preparation of the original plans.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, &c., ST. MATTHEW'S CHURCH, SMETHWICK.—After being thoroughly renovated in the interior this church was re-opened last week. Amongst the additions is a memorial window to a former parishioner, which adds greatly to the appearance of the building. This window consists of three lights and tracery, and depicts the subject of the Crucifixion. The central feature is the representation of Our Lord; kneeling at the foot of the Cross is Mary Magdalene, with upturned and tear-stained face. In the light on the left is represented the Virgin Mary, and with her, Mary, the mother of James; on the right, the loving disciple St. John, and a Roman soldier. In the tracery are emblems of the Evangelists and sacred monograms. The artist was Mr. S. Evans, of West Smethwick. A new mosaic floor has been laid in the church, and a portion of this consists of a medallion representing St. Matthew, with ecclesiastical monograms, and an elaborate border. The chancel is approached by two Devonshire marble steps, and is divided from the nave by an alabaster dwarf screen. Marble steps also lead up to the sanctuary, which is laid with marble paving in geometrical squares. An alabaster reredos has been placed at the back of the altar. The architects for the whole were Messrs. Wood & Kendrick, of West Bromwich.

FOREIGN AND COLONIAL.

FRANCE.—The town of Bordeaux is to inaugurate shortly, on the lawn of its Jardin des Plantes, a monument to the memory of the designer Maxime Lalanne. The monument is the work of M. Pierre Granet, sculptor, and includes a lofty marble stele supporting a bronze bust of Lalanne. A branch of foliage serves as a background to the bust, and a child, seated on the branch, writes the name of the artist on the marble. M. Formigé has been commissioned to prepare the plans of a monument to be erected at Saint-Dié, to the memory of Jules Ferry. A mechanically-worked tramway is shortly to be commenced, to connect Dinard with the coast bathing-stations, St. Enogat, St. Jacut, St. Lunsire, &c., and to terminate at the port of Saint-Brieuc. A Municipal casino is to be built at Anney, in connexion with the hydro-pneumatic establishment. The Municipal Council of Avignon, no doubt stung by the criticisms on its proposal to demolish the walls of the city, has now demanded that the use of the old Papal Palace as a barracks should be discontinued, and that it should be turned into a museum for provincial antiquities. A new casino is to be built at Tréport, at a cost of 300,000 francs. The inauguration of M. Falgüère's fine statue of La-Rochefoucauld took place at St. Aubin de Baugbie on Sunday last; and on the same day the monument to President Carnot at Fontainebleau was inaugurated; the sculptor is M. Peyrol. On the same day took place a third inauguration, that of the monument erected at Decazeville in honour of the engineer, François Cabrol, the founder of the Decazeville Mills; M. Puech is the sculptor. A curious discovery has been announced as made at the Cathedral of Angers. In the course of some work done in the choir the workmen have come on two coffins, and are supposed to be those of King René of Anjou, and his wife, Isabella of Lorraine. A crown and sceptre seem to be conclusive as to the identity of the royal coffin, over

which there was formerly a splendid tomb, destroyed in 1794. The vault escaped injury in consequence of the woodwork and stalls concealing it. The death is announced of M. Auguste Dufrené, Architect to the Town and Hospitals of Blois, at the age of forty-three. Having studied in Paris, he settled at an early age at Blois, where his father, also an architect, was "Inspecteur des Travaux." He was a member of the Société des Architectes de Blois.

MISCELLANEOUS.

STAIR-TREADS.—We are informed that the Safety Tread Syndicate (Mason's Patent) have been appointed contractors to the War Office, the Admiralty, and the India Office for the supply of their Safety Stair-treads.

PUBLIC IMPROVEMENTS, SOUTHPORT.—A number of public works, which have been carried out by the Corporation of Southport, were formally opened last week by the Mayor. They included a new marine drive, which is over three-quarters of a mile in length, and encloses about ninety acres of foreshore. Two marine lakes have been joined, and the drive is carried over, alongside the pier, by means of an iron bridge, the whole of the work having cost 27,000*l.*, bringing the total expenditure of the Corporation upon foreshore works, since the purchase of the foreshore, up to 120,000*l.* Subsequently an extension of the electric light plant was inaugurated at Crowlands, which trebles the former capacity of the works, bringing it up from 4,000 8-c-p. lamps to 12,000 8-c-p. lamps. Then a recreation-ground close by, and a second one at the end of Duke-street ground, were declared open. An infirmary was also opened in Seacombe New-road. It is built of brick and stone; its general form is quadrangular, the administrative block being in the centre, the wards running down on either side. It has cost 25,000*l.*; Mr. C. Sydney Ingham, of Manchester, was the architect.

"AUTOMATIC" SAFETY WHEEL STOP.—Mr. F. Hughes (Dulwich) sends an illustration and description of a patent safety wheel stop, by which the wheel of any conveyance can be immediately locked when the vehicle is temporarily left unattended by the driver, thus leaving it at all events difficult for the horse to start off with the vehicle. It consists of a short arm, with a rubber collar to prevent injury to the spoke of the wheel, which is fixed at right-angles to a vertical axle, and can be turned round so as to project between the spokes. It is not properly "automatic," as it is called, but can be applied by a single turn of the hand.

SCHOOL OF ART WOOD-CARVING.—This school, in connexion with the Central Technical College, Exhibition-road, South Kensington, has been reopened after the usual summer vacation, and we are asked to state that one or two of the free studentships in the evening classes, maintained by means of funds granted to the School by the City and Guilds of London Institute, are vacant.

LEGAL.

ALLEGED BREACH OF A BUILDING AGREEMENT.

COUNSEL applied *ex parte* to Mr. Justice Hawkins, sitting as Vacation Judge, on Tuesday last, in the case of *Jenkins v. Thomas* for an interim injunction, restraining the defendant, who occupied land under a building agreement, from building otherwise than in accordance with the agreement. The learned counsel stated that the plaintiff was the owner of an estate which was being developed in the usual way, and the building agreement with the defendant contained a clause that the defendant was only to build in accordance with the plans and elevations prepared by the plaintiff's architect, and the defendant had built otherwise than in accordance with the plans. The injunction (he learned counsel) applied for would not hurt the defendant.

His Lordship: I do not know whether it will or not. If it does you will have to bear the penalty of it. When did you first discover what the plaintiff was doing?

The learned counsel replied that it was discovered in June or July last, but the defendant had then stopped the work for two months, but had since commenced it again.

After some further discussion his Lordship acceded to the application, and gave the plaintiff leave to serve notice of motion with the writ for next Tuesday.

ALLEGED INTERFERENCE WITH A PARTY-WALL.

THE CASE of *Wood v. Lane* came before Mr. Justice Hawkins, in the Vacation Court, on Tuesday last, it being an application to restrain the defendant from interfering with or demolishing a party-wall.

Mr. Alexander, Q.C., for the plaintiffs, said that one plaintiff was the lessee of a house, No. 170, Holloway-road, and Geo. W. Mills, the other plaintiff, was the tenant of the house, No. 171, Watson Senr. was the chairman of the governing body of an institution called the North Polytechnic, the large

SEPT. 19-17, 453, T. Wilson, Catch or Fastener
Windows, sash, &c., 17, 453, Bodley, Perforated
Icks or Blocks-17, 459, E. G. Ewart and F. Hilling-
ton, Sheet-metal-roofing-17, 454, B. Gypson, Attaching
iron-locks to their Spindles-17, 535, W. Thompson,
Sash and Window Frames.

SEPT. 20-17, 545, H. Sutcliffe, Water-closets-
17, 558, J. & J. Meikle, Cements, &c.-17, 559,
Preston, Fittings for Sash-windows-17, 565, A.
Gibson, Water-closets, &c.-17, 565, T. Blackwell,
nash-sheds.

SEPT. 21-17, 568, D. Murdoch, Brickmaking
churns-17, 569, E. Smith, Plaster-Boards, &c.-
17, 571, J. Hampton, Floor-cramps, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

5,919, W. Evans, Draught Excluders for Doors-16, 186,
Smith, Hand Levels-16, 262, E. Bernard, Syphon-
pipes-16, 265, A. Pinford, Closet-seat-16, 314, L.
rtin, Glazed Brick or Tile-16, 315, F. Collins, Lock-
s Bolt for Water-closets, Lavatories, &c.-16, 318, J.
Jington, Weather-board or Draught-excluder for Doors-
16, 340, D. Smith, Hinges for Doors-16, 545, A. & T.
righ, Sanitary Pipes, &c.-16, 546, S. Mason, Syphon
pipes or Waste-water Preventers, &c.-16, 554, F. & F.
Grah, Window-fastener-16, 604, G. Brooks, Locking
Window-sashes-16, 601, J. Thompson, Plaster, &c.-
16, 621, J. Parker and F. Bishop, of the firm of Martin &
C. Fryer, of 22, Fenchurch-lane, London, E.C., Jarvis,
ring Window-sashes-16, 725, A. Perkins, Bricks-16,
60, H. & A. Stevenson, Ornamental Surfaces for Deco-
rative Purposes-16, 844, F. Demolder, Preventing Ice
coming in from Windows.

COMPLETE SPECIFICATIONS ACCEPTED.
(Open to Opposition for Two Months.)

8,394, C. Williams and J. Stotter, Disinfecting Cisterns,
&c., for Water-closets-22, 675, D. Macpherson,
Iron Brushes and Tins-14, 778, L. Grossmann, Fasteners
Doors and Windows-15, 546, A. Scott, Fire-gate-
125, J. Abbott, Combining Valve and Water-tap.

ME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

SEPT. 23-By *Brown & Foulkes* (at Berkham-
sted): "Egerton House" and "Egerton Cottage,"
1st-st., Berkhamsted, Herts, 1, 2,000l.; 22, and 24,
St. 1, 1, 2, 3, 6, 6d.

SEPT. 24-By *W. Houghton*: F. bldg. site,
wharf premises, Higham-road, East Ham, 1,300l.-By
M. Burnett & Eldridge: 23, Kingsdown-road,
London, E. 12, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33,
34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48,
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PLAISTOW (Essex).—For the erection of school buildings, &c., at Plaistow, for the West Ham School Board. Messrs. Newman & Jacques, architects, 2, Fen-court, E.C. Quantities by Messrs. L. Curtis & Son —
 Stimpson & Co. £79 4s
 Perry & Co. 21 4s
 Knight & Son 21 4s
 Sharpe 21 4s
 * Accepted subject to the approval of the Education Department.

RUNCORN.—For the erection of dormitory at the Workhouse, Dalton, for the Union Guardians. Mr. Samuel Davies, architect: Runcorn and Frodsham —
 Steffens & Carter £215 0
 Pennington 245 0
 Gaskell & Co. 245 0
 T. Bradshaw 245 0
 J. Nelson 245 0
 C. Gleave 245 0
 J. Little 245 0
 * Accepted.

SANDBACH.—For the erection of a house at the waterworks pumping station, for the Urban District Council. Mr. Alfred Price, engineer, Elworth, Sandbach —
 J. Stringer £228 0
 J. Mellor 191 0
 Board & Shaw £215 0

SEVENOAKS.—For alterations to school buildings, Cobden-road, for the School Board. Mr. Thos. Porter, architect, 49, London-road, Sevenoaks. Quantities by the architect —
 E. Bevan £424 0
 W. H. Hodges £12 10
 W. H. Hodges & Son 297 0
 * Accepted.

SHEFFIELD.—For the erection of shops, offices, &c., High-street, for the trustees of the late Mr. G. H. Foster, Messrs. Pluckton, Gibb, & Mackinnon, architects, 15, St. James's, Sheffield —

Excepting ironwork.
 G. Webster £2,000 0
 J. Walker & Son 2,750 0
 C. Carr 2,600 0
 F. Ives 2,750 0
 * Accepted.

Proof order, 11/5.
 Newton, Chambers, & Co. £1,575 5 11
 Moorwood, Sons, & Co. 2,750 0
 Co. 2,750 0
 * Accepted.

SOUTHAMPTON.—Accepted for the erection of refuse destructor, &c., for the Corporation. Mr. W. B. G. Bennett, C.E., Municipal offices, Southampton —
 Goddard, Massey, & Warner, Nothingham £2,600 0

STOCKPORT.—For the supply of 100 tons of pipes (Contract No. 8), for the Corporation. Mr. A. M. Fowler, C.E., 1, St. Peter's-square, Manchester —
 J. Jakes & Co. £1,975 5 6
 H. Hollindrake & Son 1,799 8 6
 Stanton Ironworks Co., Ltd. 1,649 9 5
 * Accepted.

STOKE-ON-TRENT.—For the erection of school buildings, Highfield, for the School Board. Messrs. R. Scrivener & Sons, architects, Howard-place, Hanley —
 Price £3,500 0
 Menkley & Son 3,594 18
 Stall & Robinson 3,295 0
 Smith 3,096 0
 * Accepted.

STOKE-ON-TRENT.—For additions to school buildings, Bucknall, for the School Board. Messrs. R. Scrivener & Sons, architects, Hanley —
 Ellis £94 0
 Smith 94 0
 Jackson 93 0
 * Accepted.

SURBITON (Surrey).—For the construction of a road with surface-water drains and sewer thereunder, on the Tolworth Park Estate, for the National Land Corporation, Limited. Messrs. Foley & Follett, architects, 29, John-street, Adolphus, W.C. —
 S. Challen £1,375 0
 W. Griffin 1,275 0
 W. Camille 1,129 0
 G. Thon von 1,135 0
 * Received too late to compete.

TOTNES (Devon).—For the execution of water-works, South Brent, for the Totnes Rural District Council. Mr. C. G. S. Acock, Surveyor, Bridgetown, Totnes —
 J. Shaddock £799 10 0
 Fisher & Cook 799 10 0
 G. Arscott 749 10 0
 Hosking Bros. 749 10 0
 R. Fetherbridge 714 10 0
 Dunscombe & Foot 669 0 0
 W. Shaddock 669 0 0
 W. C. Shaddock 669 0 0
 * Accepted.

(Surveyor's estimate, £575.)

WALTHAMSTOW.—For the erection of a board room, High-street, for the School Board. Mr. W. A. Longmore, architect, 7, Great Albion-street, Walthamstow, E. —
 Holland & Hooker £274 0
 J. A. Reed 244 0
 E. Fisher 244 0
 * Accepted.

TERMS OF SUBSCRIPTION.
 "THE BUILDER" is supplied DIRECT from the Office to readers in any part of the United Kingdom, at the rate of 10s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Siam, Ceylon, &c., 20s. per annum. Remittances payable to DOUGLAS FOURDRINER, at the Office, will be published by "THE BUILDER," No. 46, Catherine-street, W.C.

PUBLISHER'S NOTICES.
Registered Telegraphic Address, "THE BUILDER," LONDON.
 THE INDEX, with TITLE-PAGE, for Volume LXVIII. (Jan. to June, 1895) was given as a supplement with the number for July 13.
 CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each, also
 READING CASES (Cloth), with Straps, price 4d. each, also
 THE SIXTY-EIGHTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.
 SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

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 SITUATIONS VACANT, PARTNERSHIPS, APPOINTMENTS, SHIPS, TRADE AND GENERAL ADVERTISEMENTS.
 Six lines (about fifty words) or under 4s. 6d.
 Each additional line (about ten words) 0s. 6d.
 Terms for series of Trade advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c., may be obtained on application to the Publisher.

SITUATIONS WANTED.
 FOUR Lines (about thirty words) or under 2s. 6d.
 Each additional line (about ten words) 0s. 6d.
 PREPAID IS ABSOLUTELY NECESSARY.
 Stamps must not be sent, but all small sums should be remitted by Cash in Registered Letter or by Postal Order, payable to DOUGLAS FOURDRINER, and addressed to the Publisher of "THE BUILDER," No. 46, Catherine-street, W.C.
 Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the front page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS ON ORDERS TO DISCONTINUE THEM must reach the Office before 10 a.m. on WEDNESDAY MORNING.
 The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., sent to the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have their notices addressed to the Office, 46, Catherine-street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES. { NINEPENCE EACH. By Post (carefully packed), 1s.

J. J. ETRIDGE, JR.
 SLATE MERCHANT,
 SLATER and TILER.

ESTIMATES GIVEN FOR
SLATING AND TILING,
 To be Executed by Contract in any part of ENGLAND.
 Penrhyn - Bangor,
 Oakeley - Palmerston,
 And other description of Slates ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to
BETHNAL GREEN SLATE WORKS,
 BETHNAL GREEN, LONDON, E.

TO CORRESPONDENTS.
 J. W. & S. J. M. & S. W. R. A. & C. G. C. G. (amounts shown have been stated). The responsibility of signed articles, and papers sent to the Editor, is assumed by the authors.
 NOTE.—The responsibility of signed articles, and papers sent to the Editor, is assumed by the authors.
 We cannot undertake to return rejected communications. Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESTROYED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SUBSCRIBERS in LONDON and the SUBURBS preparing at the Publishing Office, 125, per annum, 4s. 6d. per quarter, can ensure receiving "The Builder" by Friday Morning's Post.

THE BATH STONE FIRMS, LTD.
 BATH.
 FOR ALL THE PROVED KINDS OF
BATE STONE.
 FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE.
 The attention of Architects is specially invited to the durability and beautiful colour of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates from Address, The Ham Hill Stone Co., Norton, Stoke-under-Ham, Somerset. London Agent: Mr. E. J. Williams, 16, Craven-st., Strand, W.C. (Adv.)

Asphalte.—The Seyssel and Metalic Asphalt Company (Mr. H. Glenn), Office, 4, Poultrey, E.C.—The best and cheapest materials for damp courses, railway tracks, warehouse floors, flat roofs, stables, cow-sheds and milk-room granaries, tun-rooms, and terraces. Asphalt Contractors to the North Bridge Co. (Adv.)

SPRAGUE & CO'S
 INK-PHOTO PROCESS,
 4 & 5, East Harding-street,
 Fetter-Lane, E.C. (Adv.)

QUANTITIES, &c., LITHOGRAPHIC accurately and with despatch.
METCHIM & SON, 20, Parliament-st., S.W.
 "QUANTITY SURVEYORS' TABLES,"
 For 1895 price 6d. post 7d. In leather 1/- Post 1/4 (Adv.)

THE
French Asphalt
 COMPANY,

Suffolk House, Cannon-street, E.C.
 SUPPLY THE BEST MATERIAL AND WORKMANSHIP FOR BUILDINGS, DAMP COURSES, AREAS, ROOFS, WAREHOUSE AND DAIRY FLOOR, &c., &c.

This Asphalt was chosen to be laid at Sandringham, on the new General Post Office, and other important buildings.

TWELVE GOLD AND SILVER MEDALS AWARDED.

IRON CISTERN.

F. BRABY & CO.

VERY PROMPT SUPPLY.

LARGE STOCK READY.

CYLINDERS FOR HOT-WATER CIRCULATION.

Particulars on application.

LONDON:
 352 to 364, EUSTON-ROAD N.W., and
 218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL:
 6 and 8, HATTON GARDEN.

GLASGOW:
 47 and 49, ST. ENOCH-SQUARE

The Builder.

VOL. LXIX. No. 2749

OCTOBER 22, 1895.

ILLUSTRATIONS.

Proposed West Front, Manchester Cathedral.—Mr. Basil Champneys, Architect	Double-Page Ink-Photo.
Church of the Most Holy Redeemer, Chelsea: Interior View.—Mr. E. Goldie, Architect	Double-Page Photo-Litho.
Church of St. James, Spanish-place: (1) View from North-West Entrance; (2) View of Nave from Chancel.—Messrs. Goldie, Child & Goldie, Architects	Two Single-Page Ink-Photo's.
A Labour Church.—Design by Mr. G. L. Morris	Double-Page Ink-Photo.

Blocks in Text.

Notes on Pre-Conquest Architecture in England: Sketches of Monkwearmouth Church	Pages 251, 252
Plan of the New Street from Holborn to the Strand, as proposed by the London County Council	Page 253
Plan of Proposed New West Front, Manchester Cathedral	Page 258
Plan of Church of the Most Holy Redeemer, Chelsea	" 258
Photograph of Monkwearmouth Church	" 259

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A Question of Church Style.

IS there any style of architecture which should be considered as especially befitting a church? The question is not unnaturally suggested by two of our illustrations in the present issue, both of them representing the interiors of churches built recently in London, for Roman Catholic worship. It might have been expected that in two churches built at only a few years' distance of time, in the same city, for the worship of the same community, there would have been some degree of similarity of style, some evidence of an accepted idea as to the style of architectural treatment most suitable for the expression of the idea of worship. Yet a matter of fact there could not possibly be a greater contrast than between the style of these two buildings, the church at Spanish-place and the church at Chelsea. The former, the interior of which is shown in two pencil sketches by Mr. H. W. Brewer, completely and frankly a reproduction of thirteenth-century English Gothic, with its vaulted roof, clustered columns, separate aisles, and its general expression of vertical tendency in architectural design. The latter is an interior in the conventional Renaissance English style, horizontal general line, flat roofed, without aisles, with a cove in the ceiling, cut into by a rather awkward-looking device of arches intercepting the cove, which is commonly called a "Welsh vault." The one, according to generally-received ideas, could not possibly be anything but a church. The other, if we were to take away the pulpit and the reredos with its crucifix, might pass as a concert-hall or the large reception-room of a town hall. It will seem to most persons as completely secular in style as the other is completely ecclesiastical. If the Chelsea interior were that of an ultra-Protestant or Congregational church, it might be cited as an example of the vulgarising tendency of Protestantism or, sent, as compared with the specially ecclesiastical character of the Roman Catholic church, expressed with emphasis in

the Spanish-place interior. Yet not only are both erected for the Roman Catholic ritual, but both emanated from the same office, although the personality of the architectural firm to which we owe so many good Roman Catholic church designs has been to some extent changed. Considering this, one is tempted to ask again the question which has been asked before—whether there is any such thing as an ecclesiastical style at all.

Of course, during the time of Wren and his immediate successors, a church in the style of the Chelsea interior would not have impressed anyone as unsuited in architectural expression to its purpose. All the London churches were then designed in that kind of manner. It was the Gothic revival, accompanied by the ecclesiological revival, which habituated people in this country to the idea that there was in Gothic architecture an element and an expression peculiarly suited to buildings erected for worship. At the same time, oddly enough, the leading architect of the Gothic revival expressed frequently and most decisively his dislike to the idea that Gothic was essentially a church style. According to him (and he did his best to put his idea into practice), Gothic architecture was equally suitable for every class of building, and to regard it as especially a church style was to take an entirely false and one-sided view of its capabilities.

General feeling and practice, nevertheless, has so far for the most part decided against Scott in this particular. Architects and clients who will take kindly to some variety of Renaissance architecture for secular buildings, are constantly found tacitly adopting the notion that a church should be Gothic; if not a pure reproduction of Gothic, at least a modification of the style; and probably very few of our readers, on first glancing at the interior of the Chelsea church in the present issue, before noticing its title or its details of furnishing, would take it for a church. Is this to be regarded as mere prejudice and habit, or is there anything of reason and fitness at the bottom of it?

It is a question partly of association, but not altogether so. If we take an archaeological view of the subject, and think of the church in England as having realised its greatest power and influence during the Middle Ages, there is some reason for thinking it suitable to mark its revival by

the same type of building. And, in an architectural sense, although it is quite true that Gothic was not in its own day a church style, but the one style for all building, still it is also true that the churches were incomparably the greatest and most important buildings erected, and that it is in them only that the style can be studied in its highest development; so that actually and *de facto* it was a church style, though not nominally. There is, therefore, much excuse, especially for the more conservative section of churchmen, for regarding it in the present day as a style peculiarly belonging to churches. But if we decline to regard the question archæologically, and claim to evolve our own style suitable for the church of the present day, there is still a lesson to be drawn from the Mediæval churches. Putting all question of mere style aside, they present us with examples of a grandeur and severity of treatment, and an architectural expression of mystery and aspiration, which assuredly is specially suitable for the architectural treatment of buildings dedicated to spiritual aspiration. We may aim at the same quality in architecture quite independently of any question of style. A church ought to be, architecturally, severe and grand in style, and ought to hold itself aloof from all littleness and commonplaces of architectural detail. It should have an effect of solemnity.

This quality is just what is notably absent in the phase of architecture which characterised the Renaissance churches of the Stuart and Queen Anne periods, in the style of which the church at Chelsea is a revival. And this seems to have been tacitly felt to be the case, since, in spite of the number of churches in this style existing in London, we have never got to think of it as a church style; we always connect it with the idea of assembly-rooms and concert-halls. And we are convinced that there is more in this than mere prejudice. The conventional details of pedestals, pilasters with a slice of entablature over them, and panelled ceilings of the kind common to the style, are all examples of the corruption of architectural style, and are at variance with its pure and normal elements; and the flat ceiling seems equally at variance with the idea of aspiration and mystery which should characterise a building erected for worship. For a church architecture we want to keep to the broader and more essential elements of architectural expression;

to avoid artificial conventionalities of detail and to aim at grandeur and severity of effect. In Gothic church architecture of the best period we do find these qualities, and hence there is a certain suitability in it for churches, independently of association. That it is in all other respects the most suitable style for modern churches may very well be questioned; but it is possible to realise the same grand and severe quality of architectural expression without imitating the details of the style. That at least is what should be our aim in modern church architecture; and in that quality the Stuart and Georgian church architecture, despite some of the very fine general conceptions of Wren, is notably deficient, and is therefore an unsatisfactory model for church design.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND By PROFESSOR BALDWIN BROWN.

II.—Monkwearmouth Church.

BEFORE entering upon any of the more general questions suggested by the plans of Saxon churches, it will be convenient to start by making acquaintance with one of the earliest as well as one of the most remarkable of these structures, a monument that possesses some of the most characteristic and peculiar features of Pre-Conquest work in general. This is the tower and western end of the church of St. Peter at Monkwearmouth, in county Durham, a general view of which, from a photograph, is given on page 259. The existing Saxon work is shown in main aspect, and in detail in figs. 15 to 21. It is of at least two different epochs, while within the church there also occurs some well-marked early Norman masonry; the rest of the building is Late Mediaeval or modern. We are fortunate in being able to assign with practical certainty a date to the earliest and most interesting portion, comprising the western wall of the nave and the lower part of the tower, which originally formed a porch with a chamber over it. On the western side of the tower, as it at present stands (fig. 15) there are clearly seen the sloping lines of the original gable over the porch, and that the upper part of the tower is a later addition is further proved by the fact that, to a great extent, it blocks out the light from two original windows in the western wall of the nave. These windows are seen in the interior view (fig. 16). The tower walls out-

nave, leaving an upright slit, the position of which is marked by the arrow at A, in fig. 15, while a side view is given in fig. 17.

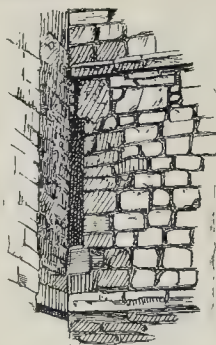


Fig. 17.—Junction of Tower and West Wall, Monkwearmouth.

This arrangement proves conclusively that the upper part of the tower is later than the base, but tells us nothing of the absolute dates of either part. Now we possess in the writings of Bede an almost contemporary notice of the first building of the Abbey of Wearmouth. Bede's account has been so often quoted that it is sufficient to say here that Benedict Biscop, founder of the monastery in the year 675 A.D., went over to Gaul and brought back with him some masons to build for him a stone church "after the manner of the Romans in which he ever took delight." From Gaul also he sent for certain workers in glass, and for sundry fittings of the church not elsewhere to be procured, he went himself on more than one journey to Rome. The fabric of the church must have been slight, for it only took a year to build; it was, on the other hand, tolerably spacious, for even in Bede's time the community of monks in the combined monasteries of Monkwearmouth and Jarrow, of which the former was the chief, numbered 600 souls. It was not the only church in the monastery, however, for we read also of a church of Our Lady and an oratory of St. Laurence, but it formed the place of assembly of the monks on important occasions, and was profusely adorned with several sets of paintings, had glazed windows, and a full equipment of sacred vessels, fittings, and vestments.

The question naturally arises whether any of the work of Benedict's masons actually survives. It is one of great importance, as the answer to it carries with it a settlement of the often-discussed problem, whether any of the existing relics of Saxon stone architecture really go back beyond the eleventh century. Now we know that the establishments at Wearmouth and Jarrow flourished greatly until the time of the disastrous inroads of the Danes, who, in the year 867, plundered and almost destroyed the churches and monasteries of Northumbria. From that date to the time of the Norman Conquest they disappear from the pages of history, but shortly after the Conquest they are, for a time, revived, and become once more the seat of monastic communities. In 1083, however, the monks from these restored monasteries are transferred to Durham, and the houses of Wearmouth and Jarrow sink to the position of unimportant subordinate cells to the great cathedral abbey.

As it is not likely that the church of Benedict Biscop would require re-building in the two hundred years between its first erection and the Danish invasion, we must ascribe the early work still existing on the site either to his time or to the period between 867 and the Norman Conquest, or, again, to the era of revival from about 1075 to 1083. With this latter date would accord the style of the Early Norman pier of the present chancel arch at the east end of the building, shown in fig. 18. It possesses

the curious bulbous base which occurs in other examples of eleventh-century work in England, such as the crypt at Lavingham

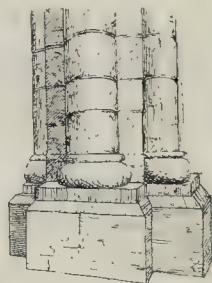


Fig. 18.—Southern Pier of Chancel Arch, Monkwearmouth.

and the slype at Worcester, while the masonry and tooling are characteristically Norman. The upper part of the tower, on the other hand, agrees closely in style with the numerous examples of square western towers, occurring in Northumberland, Lincolnshire, and other parts, which are no Norman in character, and are generally ascribed to the first half of the eleventh century. In style this tower, which has no Norman features about it, would represent a generation earlier than the pier of the chancel arch. Since we are told by Simeon of Durham that the Church of St. Peter, at Wearmouth, was burnt by Malcolm, King of Scots, in the year 1070, there may have been a restoration between 867 and that date, and to this upper part of the tower might very well belong. The questions of date now narrow themselves down to the query whether the lower portion of the tower, which we have seen to be prior to the upper, is also due to an earlier restoration after 867, or is a relic of the original work of Benedict Biscop in the seventh century. Now, Simeon of Durham, writing in Northumbria in the early years of the twelfth century, describes the havoc wrought by the Danes as so extensive that the monasteries of the province were reduced to a desert condition, only bare walls being left, and the very site of some passing out of knowledge altogether. The revival of 1075 was brought about by pious pilgrimage undertaken by some monks from the south of England, who "had learned from the history of the Angles how that the province of the Northumbrians was formerly the home of crowds of saints, monks," and who wished to visit the holy but now deserted sites.* When the country had been reduced to such a condition it is almost certain that any rebuilding of the churches ruined by the Danes would have been of a somewhat perfunctory character. The earliest work at Monkwearmouth is, however, marked by extreme care and elaboration in detail, and would have been practically impossible in that region between 867 and the eleventh century, while for its ingenuity and thoroughness it is exactly what we should expect from the wealthy and enthusiastic Benedictines. It may be added that the style of the work, though in many respects puzzling, agrees better with the early than with any later date.

The following are its main features. The West wall of the church (fig. 15) measures externally 23 ft. 6 in. in width, and 31 ft. 4 in. in height to the beginning of the slope of the gable which ran upwards at an acute angle of about 50 deg. The drawing gives the line of the original gable on the north side as it was seen in 1865, before the present north aisle was built. In the centre, an arched doorway 3 ft. 6 in. in width gave admission to the interior, and to the west of this is built a porch, measuring internally



Fig. 16.—West End, Monkwearmouth.

side rise in front of them, and light is only admitted by playing away the edge of the tower wall where it abuts on that of the

* Simeon of Durham, "Hist. Dunelm. Eccl.," III., 201.

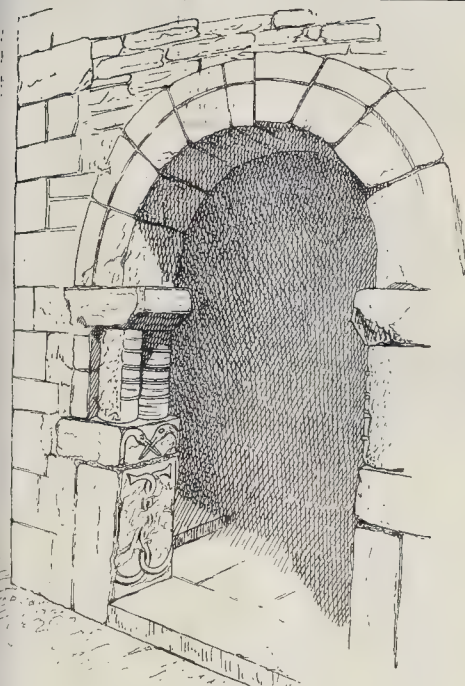


Fig. 19.—Monkwearmouth Porch (circa A.D. 675).

ft. from north to south by 9 ft. 5 in. from east to west, and covered with a barrel vault of stonework running east and west, 6 ft. 6 in. high to the crown. There are porches to the porch on all four faces. Those to the north and south, 2 ft. 5 in. in width, have their jambs rebated and heads splayed for doors opening outwards. The east door leads to the church. The western archway, 4 ft. 10 in. in width, which has never been closed by a door, is of extremely elaborate construction, and gives its stamp to the whole work (fig. 19). Its jambs are composed of upright slabs lining the opening, surmounted by other slabs laid flat and bonding into the wall. On the surfaces thus formed there is



Fig. 20.—Southern jamb, Monkwearmouth.

understood from the drawing (fig. 20), which shows the condition of the slabs when first uncovered in 1865. On these slabs, as on a plinth, stand on each side two stone shafts, about 21 in. high by 10 in. in diameter, ornamented with an elaborate system of projections, and cuts that have evidently been produced in a lathe. These turned mouldings are far superior in their delicacy and accurate cutting (fig. 21) to the general run of Saxon baluster shafts. These twin colonnettes carry a massive impost 11 in. high, chamfered beneath, and worked on all its edges with a roll moulding. From these springs the arch, formed of nine carefully-cut voussoir stones of varying sizes, running right through the thickness of the arch, and once recessed on both outer and inner face, after the manner of the Ionic architrave. Above the arch, at a height of 13 ft. 3 in. above the ground, the face of the porch is enriched with a flat string-course, composed of various panels framed with cable mouldings, and carved in low relief with representations of animals, apparently of a somewhat grotesque kind.



Fig. 21.—Baluster Shaft, Monkwearmouth.

At a higher level comes a comparatively large window, giving light to the chamber over the porch, from which also a narrow opening, now the only means of access to the interior of the tower, forms a communication with the nave of the church. Above this again is a second string-course, and from this level, at a height of 21 ft. above the ground, began the slope of the original gable that surmounted the porch. Under the apex of this gable there are five large stones let into the wall, the uppermost of which projects like a semicircular disc set horizontally, while the second shows the outline and shape of a human head, the tip of the lobe of the right ear being still, on a close inspection, visible. The two large stones next below have been hacked away flush with the wall, and the lowest has evidently been renewed in more modern times. It is clear that there was a statue here in high relief, about 6 ft. in height, and as it is placed with reference to the original gable, and has about it no marks of being a later insertion, it is presumably of early date. A work of sculpture of the kind on so large a scale may astonish us in the seventh century, but it is at least as likely to have been executed then as at any later period up to the twelfth. The contemporary church built by Wilfrid at Hexham was adorned, we are told by a Hexham writer of the twelfth century, with divers figures carved in bold relief on the stone. The rest of the



Fig. 15.—Monkwearmouth Tower, before last restoration.

tower, as we have seen, is in the style generally recognised as Saxon of the eleventh century. Its total height is 60 ft., which, on a face width of a little over 11 ft., represents proportions far taller and more slender than occur in English Norman architecture. It is not reduced by sets-off, nor was it intended to taper, though the weight of the tower bearing on the western archway has caused it to spread slightly, and made the tower measure an inch or two more at the base than at the summit.

With respect to the body of the church, the two westerly quoins of the nave give us its external width. Its interior breadth was about 19 ft. If the Early Norman chancel arch is in the same position as its Saxon predecessor, the length of the nave would be 66 ft. Nothing is known of the Saxon chancel, and no attention need be paid to older writers, who say that "it probably terminated in an apse," as it is almost certain that, like Escomb, it ended square.

Such are the outstanding features of the oldest part of Monkwearmouth which bears so many marks of having been the work of the masons employed by Benedict Biscop. Most writers on this interesting building have been content to describe it and to point to it complacently as an example of Roman or Gallo-Roman handiwork. It does not seem to have been sufficiently noticed how very unlike in many most important features to Roman or Gallo-Roman work is the oldest portion of Monkwearmouth Church. The un-Roman character is so conspicuous that it makes it all the more important to be clear as to the evidence for the date. There is a good deal in the porch that is certainly "after the manner of the Romans," but the general form and proportions of the church are not Roman or Gallo-Roman, but descend from another tradition altogether. The writer of the account of the church quoted in the new edition of Murray's "Handbook to Durham and Northumberland," speaking of the proportions of the church, says that "if the rule of 'three cubes' was observed, the height of the side walls of the nave would be 22 ft. 8 in." The question is not what they "would be," but what they are, and they rise more than 30 ft. above the ground, thus producing a ratio of height to width in the interior that is wholly unclassical, and that opens up interesting questions of early influences on our architecture that will be discussed in subsequent papers.

NOTES.

THE results which would be likely to follow from the adoption of a Registration Act applying to architects are delightfully illustrated by a circular which has been sent round to a number of members of the architectural profession during the last few days, from a newly-constituted body which calls itself the "Institute of Architects and Surveyors," and the object of which, indicated in the most barefaced manner, is to provide a Society which, in the exceedingly improbable event of the passing of a Registration Bill, would take under its protection the class of architects and surveyors who would have no support from the Institute or the Surveyors' Institution. This is put almost in so many words in the circular: "As in all probability this Act will affect you, my Council thought you might desire to join to strengthen our hands in an endeavour which we are about to make to secure a larger protection for our members. *If we do not do this at once, it is probable that the members of certain Institutes may secure inequitable professional monopolies.*" The italics are ours. The whole movement for registration was started, as we remarked at the time, by an association of persons who were mere nobodies in architecture; but there seems to be "within the lowest deep a lower deep," disclosed by this unblushing circular. The President, Vice-President, and Council of this "Institute" are a group of persons whose names we never heard of before in

connexion with architecture; the document shows that the framers of it have never even learned grammar, and they call their legal adviser their "council." The point of the whole thing, however, is the additional evidence it furnishes that any such scheme as the official registration of architects will simply be used by persons who form the dregs of the profession to get themselves officially recognised.

THE latest plan for the proposed new street from Holborn to the Strand, as given on the opposite page, seems in itself a satisfactory one. It interferes with nothing that is of any value in an architectural or picturesque sense, and the treatment of the connexion with the Strand and Fleet-street is satisfactory both in an architectural and a practical sense. The weak point is no doubt the connexion with Holborn, which would be much improved by the spreading out of the street right and left to enter Holborn at an oblique angle, and give a wider space for the movement of traffic at this turning-point, in the same manner as at the junction with the Strand. But in the main this is the best and most practical of the schemes proposed, and we are glad to find that the idea of taking the street through Lincoln's Inn-fields, which would have entirely destroyed the character of that square, seems definitely abandoned. It is melancholy to have to record, however, that after six years of talk, and the final production of a good practicable plan, the dilatory policy of the London County Council has again postponed the execution of an improvement so imperatively demanded, and the realisation of which seems as far off as ever.

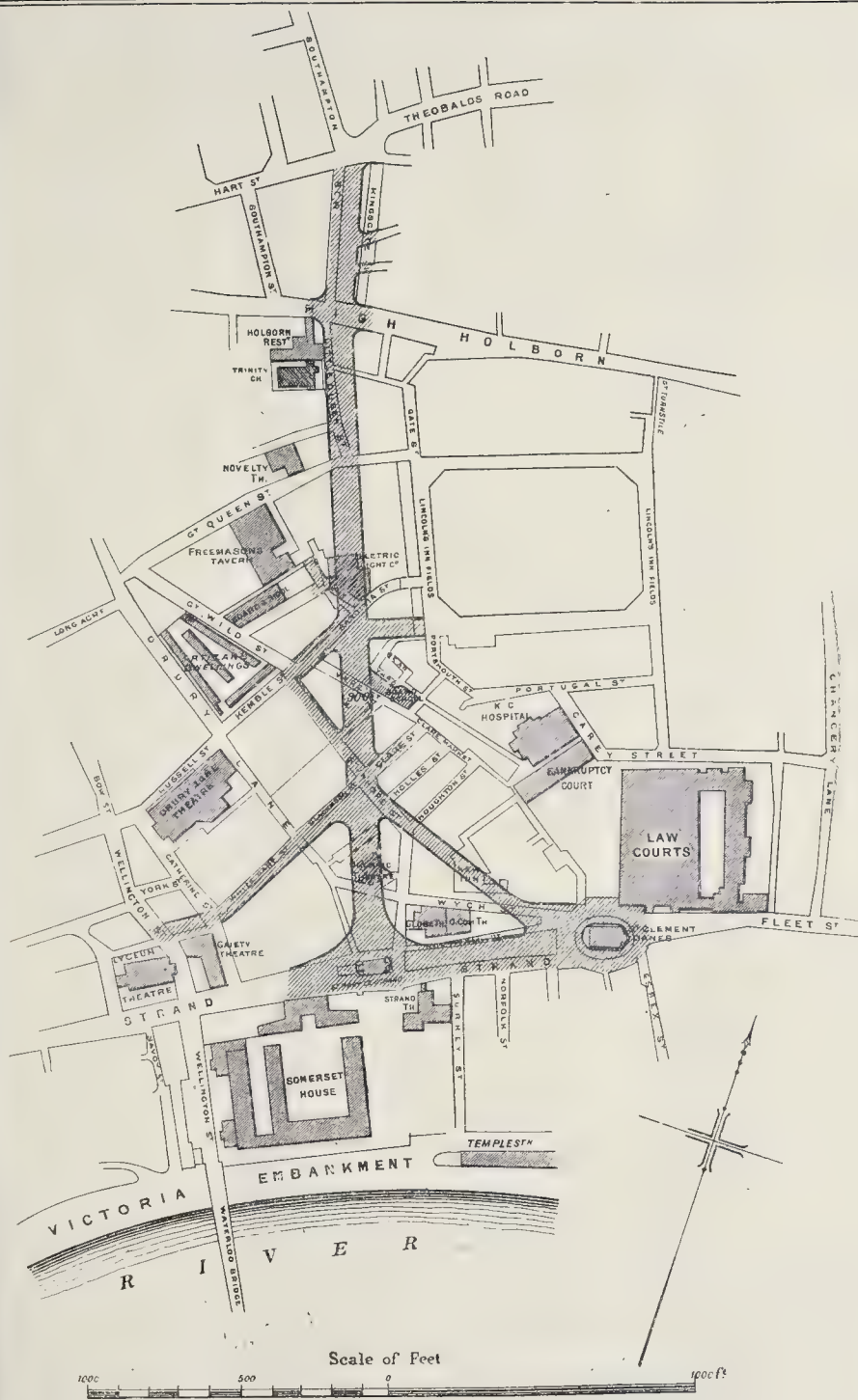
IT is to be hoped that the proposed clearance of the region behind the Strand, westward of the Law Courts, is not to be another of those improvements which are talked of and postponed. Those who have been in the habit of taking occasionally the short cut from the Strand to Lincoln's Inn Fields by way of the alley called Clare Market, must rejoice to think that there is a prospect of a clean sweep being made of this foul and insanitary corner of London, about which the fetid odour of generations of dirt seems to hang. The entire clearing-out of every such site as this is a step towards the sanitary millennium, for which one must feel thankful, slow though the progress is.

THE discussion which was raised in the County Council as to the question of employing the Architect to the Council to carry out all the buildings on the Milbank site was a rather foolish one. Some members seemed to think that it was a kind of slight to Mr. Blashill that he should be commissioned to lay out the ground, but that it should be proposed to call in outside architects to design the principal buildings. We should hardly suppose Mr. Blashill would take that view; at all events we cannot. The consideration of the way in which a site like that should be laid out would come naturally into the province of the official architect; the designing of separate buildings on it does not; and it is not at all desirable that important buildings on different sites should all be carried out by the same official architect, which must inevitably lead to a kind of official sameness of character being stamped upon them.

THE municipal electrical works at Tunbridge Wells, which were opened on Wednesday, show that those towns which are in no hurry to adopt the electric light get the advantage of the experience gained by the pioneer systems tried elsewhere. Although the Corporation got their Provisional Order in 1890, it was nearly three years later before they asked Mr. W. H. Preece to report on the best method of light-

ing the town. He advised that the alternating current system should be adopted, owing to the straggling nature of the area to be served. This system admitting of great latitude in choosing a site for the works, a site was chosen adjoining the goods station of the South-Eastern Railway, which is particularly convenient for coal and water supply. The present plant consists of two 100-horsepower alternators, and a 20-horsepower alternator to take the day load. The distribution is on the high-tension system, the current being supplied direct to seven sub-stations, which are underground chambers in the public roads, and from thence to their consumers. In addition, a separate arc-light main is laid in the chief streets of the town. The current in this main is rectified by means of a 25-light Ferranti rectifier, in order that the maximum lighting effect may be got from the arc-lamps. There are two of these rectifiers in the Central Station, one of them being kept as a reserve. They are practically the same as those which have worked successfully at Portsmouth, and the regulating gear has been found so sensitive that in the event of a sudden change of load, as when a lamp is extinguished, there is practically no variation in the light of the others. There is one point about the electric lighting supply that is open to criticism, and that is that 68 has been chosen as the frequency of their current. It is true that they are only following the example set by other English supply companies, hardly any two of them choosing the same frequency; but this want of uniformity is not creditable to English electricians. Special types of choking coils, arc-lamps, &c., have to be made to suit each frequency, and meters have also to be tested with an alternating current, whose frequency is the same as that of the supply which they are afterwards to measure. All this entails a quite unnecessary increase of labour to the manufacturers, as nothing is gained by choosing an abnormal frequency.

IN another column we print an abstract of a paper read before the Society of Engineers on Monday last, by Mr. R. E. Middleton, C.E., entitled "The Relative Value of Percolation Gauges." The subject is by no means new, but it is opportune in view of the interest taken at the present time in all matters pertaining to water supply. The gauges used are well-known to everyone who has studied the water supply question, and the circumstance that "there are remarkable discrepancies between the records of the gauges themselves, and that the percentage of rainfall which percolates does not appear to be consistent throughout," is not wonderful in view of the facts. There is one very important point that does not seem to have occurred to the author (at least, it is not alluded to in the abstract sent to us), and it appears to be generally overlooked by engineers when dealing with quantity of water available from a given area, that is, that sufficient allowance is not made for the errors to which the ordinary "Snowdon" or similar rain gauges are subject. We are told by the author that such and such a percentage of the actual rainfall passed during certain years through the percolation gauges mentioned. Now, in order to arrive at that percentage, the total rainfall must, of course, be first ascertained, and herein consists a great difficulty. The methods adopted are highly unsatisfactory, even with gauges of the same pattern, where it might at first sight be imagined that, possessing errors in common, the results must be comparative. The character of a particular shower of rain, whether it was steady and coming down vertically, or being driven in a slanting direction by the wind, makes all the difference in the registration. We all remember the anecdote of the meteorologist who went on the roof of his observatory, and speedily got wet through by the "blinding rain," and all the time his rain-gauge was registering practically nil. Rain is extremely local in its occurrence,



Plan of the new street from Holborn to the Strand, as proposed by the London County Council.

and the proportion of it available for water-supply purposes from underground sources largely rests with the daily distribution. And if we have continuous rain for a week, more water is available than if the rainfall

is spread over a long period in dribbles. The problem of evaporation, much as it has been studied, is not yet well understood; and we think that all these things in a certain measure account for the discrepancies

alluded to by the author. That a large quantity of water passes out of the London basin underground and is lost is a well-known fact, and it has more than once been proposed to search for and utilise it; but we

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cannot think that that loss amounts to as much, in the case of the Thames, as 697 millions of gallons daily. We would much rather believe that the rain-gauges are at fault. However, Mr. Middleton has done well to bring up the subject, if only to show us how little reliance can be placed in certain water-supply statistics.

IN the pages of *L'Architecture* M. F. Jourdain has had the idea of "drawing" some eminent men of the day for their opinions on the state of architecture, and has commenced with M. Daudet. The eminent novelist has not very much to say on the subject, and what he does say is neither very instructive nor very complimentary: it is comprised in the following paragraph:—

"Que pensez-vous de l'architecture moderne? Je pense que je n'en pense rien, et c'est un sérieux reproche que cette indifférence où elle laisse des yeux que l'art intéresse et préoccupe. Quelques folies reproductions de vieux modèles surgissent ci et là, sur un quai, dans une avenue, mais en général la maison moderne est laide. On a réussi quelques gares, c'est tout.

Comment je voudrais l'architecture?—Avant tout, appropriée à notre climat. Quant à lui indiquer sa voie, j'en suis fort incapable, ne m'étant jamais occupé de votre art."

There are some other French men of letters who would probably have a good deal more to say on the subject, and will perhaps be persuaded to give their opinions in time. For the present, the only other witness examined by M. Jourdain is M. Roty, the well-known medalist, who considers the Greeks "plus gentils que les modernes, car ils mettaient beaucoup de sculpture dans leur architecture," and is well content that the French architects who have studied at Rome should make pediments and columns in Paris—"ça me rappelle Rome de loin, c'est encore bon." He loves the pen sketches of the Renaissance architects to be found in the Louvre, better than the "beaux chapiteaux bien lavés qu'on envoie tous les ans de la Villa" [Medici]. In short, M. Roty is one of the old-fashioned *dilettanti* in architecture. Naturally, he looks with great apprehension to the possible imitation in Paris of the American style of "maisons de trente étages."

THE late Mr. W. W. Story, the sculptor, who has just died in his seventy-sixth year, may be said to have belonged rather to the last than to the present generation of artists. He was an instance of the artist of the cultured type, who had many objects of interest besides his art; and indeed his pleasantly-written book, "Roba di Roma," once to be found on many drawing-room tables in this country, was probably more familiar to many persons than his sculpture. Without meriting the title of a great sculptor, he brought to all his works a refinement of thought and feeling which gave them interest. He was one of the competitors for the Byron monument competition in London a good many years ago, which ended so unfortunately, and produced a sketch-model which was one of the best designs submitted, though it was said not to be a good likeness of Byron.

THE *Engineering Record* mentions and illustrates a method of treating a street of steep gradient in the town of Burlington (Iowa), which seems to have the merit of being both practical and decorative in its results. The street seems to have been a very wide one to begin with, and the actual roadway for vehicles has been formed in a serpentine curve touching alternately the extreme border-line of the road space. This has been paved with brick with stone curbs, and the spaces between the loops laid with turf, planted with trees, and supplied with benches. The gradient for vehicles has been thus reduced from 24 in 100 to 14½.

THE memorial presented by the tradesmen of Bishopsgate Within to the Commissioners of Sewers, with respect to

the struts which have been in use in that important thoroughfare for two years, opens up a question of considerable importance to the building community and the general public. The Commissioners, naturally enough, reminded the memorialists that the responsibility of securing the safety of the public in such cases rested with the District Surveyor, and that it would be unwise to make any move in the desired direction without his sanction and approval. Eventually it was decided to refer the matter to the Streets Committee, who will not, it may safely be assumed, take any steps to remove the supports in question without the consent of the District Surveyor. That the shorings complained of are a source of annoyance to the tradesmen concerned is probable enough, but they would find the collapse of a neighbouring house a more serious annoyance, even apart from the consideration of the duty of providing for the safety of the public, for which in this respect the District Surveyor is responsible.

IT may be as well that some members of the architectural profession (the remark naturally only applies to some, but unfortunately to far too many) should understand that it is of no use for them to send up to us commendations of their own work written by themselves. The unblushing manner in which this is done by some professional men is astonishing. A few days ago we received a notification of the result of a competition, concluding with the remark that "the conditions imposed by the instructions rendered the problem a very difficult one, but that it had been solved in a very able manner by the successful competitor," the words being written by the architect himself on note-paper stamped with his own address. This is an exceptionally bad instance, but the insertion of laudatory adjectives by architects in sending a description of their own work is, we regret to say, exceedingly common, and nothing could be in worse taste. We are always obliged to architectural correspondents for practical descriptions of their work, but without the "adjectives."

MANCHESTER ARCHITECTURAL SOCIETY:

QUESTION OF EDUCATION AND COMPETITION.

In his opening address, delivered on the 1st of this month, Mr. John Holden, the President of the Manchester Society of Architects, after speaking of the loss which the Society had sustained by the recent death of two of its most esteemed members, Mr. Murgatroyd and Mr. Lawrence Booth, and touching on some matters of local interest in connexion with the change in the meeting-place of the Society, said:—

"The classes in architecture which were specially arranged between the Committee of the Technical School and the Council of this Society have not, I find, been attended as satisfactorily as I could wish. These classes cannot fail to be of great use to the students, especially to those who desire to take any position in the profession and to pass the examination necessary for that purpose, and while I do not advocate the system of cramming, which is bad in principle, still it is greatly to the advantage of the student that his energies should be directed into a proper channel instead of being wasted on matters of comparatively little importance. It would, I am sure, be a matter of regret to most of us if, from a want of proper support, these classes should be discontinued, and we must remember that there are so many subjects now thoroughly taught in the Technical School and its branches, and the classes are so largely attended, as a rule, that it is hardly likely the Committee of Management will continue to deal with a subject specially for a few students only.

As to the value of the instruction to be obtained at these schools, I think there can hardly be a doubt. We must remember that teaching is as much an art as architecture itself, and a person requires to be trained to it just as much as to any other profession. It is not every professional or business man who can satisfactorily impart a knowledge of his particular branch to a student, although he may be a master of his craft. This I have particularly noticed for many years, and I think you yourselves, if you will consider

the subject, will agree with me. At the same time, I wish you not to misunderstand me, and to suppose that the technical schools, or any other similar establishment, can by themselves make either an architect or any other business man. This would be a mistake. These schools are the most valuable adjunct to all businesses which are taught in them, and the student will receive there instruction in the theoretical and practical branches of his own particular craft, which he cannot obtain at his employer's office or works. And it is the interest of the teachers to impart this knowledge to him. The principals or employers now-a-days are busy men and have neither the time nor (in many cases) the inclination to sit down alongside a student and instruct him. Generally the youth is passed into the office or works, introduced to the notice of the chief clerk or foreman, and left in his charge and expected to make himself useful. He must then depend upon himself. If he pushes his way he may get instruction and assistance; if not, he simply works out his time. In any event he obtains simply a knowledge of the business as carried out in that particular office or establishment, and we all know that no two offices are alike. All professions and businesses are divided into specialties, and none more so than our profession. It is therefore important that the student should, in addition to his ordinary office routine, pass part of his time in another place, where he will receive that instruction which he cannot obtain amidst the worry and bustle of a business establishment.

I speak strongly on this subject, as I wish not only the students but the older members to remember it, and to allow to their pupils the time to enable them to attend these classes. I know that in a busy establishment there are times when all hands are required, but I ask you, the seniors, to discriminate between your pupils and your employees. Remember that the pupil comes to you for a certain purpose, and often—in fact generally—pays a large premium, and is therefore entitled to consideration; in fact, you are under moral, and generally also legal, covenant to teach him his business as such is carried on in your establishment, and you are to a certain extent responsible for his future. This is an entirely different position to your relations with your employees or clerks, who are engaged to do your work, and to whom you are under no obligation as to teaching. I ask you, therefore, not only to allow your pupils the necessary time to attend the classes provided for them, but also use your influence and to see that they do attend to, in fact, exercise that control and supervision over them which you would do over your own son.

I confess that I should like to see more of our Manchester students entering themselves for the Royal Institution examinations. There must be a very large number of pupils in the different offices in the city and suburbs, even those represented in this Society, yet very few put in an appearance. The examinations have been brought to Manchester now many times not without trouble, and have been conducted here at a very considerable expenditure of time on the part of a comparatively few members, yet I notice that very few of our Manchester students take advantage of them. If you examine the attendances at the preliminary examination one in each year, you will find that in—

1893, Novem. : 9 students attended, none from Manchester.
1894, March : 16 " 3 from Manchester (all passed).
1895, March : 25 " 2 " (none passed).

So that, out of fifty students attending these examinations, but five were from the principal city, and but three passed; and I particularly notice that many of the smaller towns send up two or three students to each examination, while a large and important city like Manchester, with its several hundred practising architects, can only provide three candidates at the most. There is surely something wrong here, and it is for us to find out the reason and rectify it.

In the qualifying examinations I find the same conditions existing, the proportion rather better, but the numbers small and the result poor.

Taking the same three years, the result is as follows:—

1893, 8 candidates attended, 4 from Manchester, 1 passed.
1894, 8 " " 2 " " 1 " "
1895, 5 " (relegated) 1 " " 1 " "

These results cannot be satisfactory, and I must confess I do not understand it.

On the roll of this Society, which, as you are aware, does not include the whole of the practising architects in the city, there were in

1892-3 24 students.
1893-4 30 "
1894-5 35 "

Another matter which has exercised my mind been the use of the library. The library is, of course, as yet a very large one, although increasing; still, it even now contains a considerable number of the best standard works, critically it contains all that is required for an ordinary student in architecture who wishes to do the examinations. The register shows, however, that nothing like the use is made of it that character of the books deserves.

Now, a word or two about the prizes given by the Society. I note that the small 10s. and 5s. prizes which entail comparatively little labour or expense on the part of the student are taken up, the larger prizes are either not competed for, or the responses are poor and unworthy of the prize to be awarded. One prize of 5*l.* 5*s.* has not been awarded since 1891. The larger prizes, which are given on the recommendation of the initial School Committee, I am pleased to say in this year in Manchester, and I have every reason to believe have been well earned. This system of education is a serious one as affecting Society, and I confess that I cannot understand it. I should be glad of any information which would assist the Council in dealing with it. I invite communications from the students and others on the subject, which may explain in some way the great lassitude and indifference which is run through the body of students. I am that the Council will carefully consider any communications, and, if possible, meet the defect and remedy the defects.

In some years past I have noticed the gradual decline, I may say, of the study of Classic architecture amongst the students; the more modern and sensational styles have been adopted and brought to the front. This is, I venture to say, a mistake on the students' part; as a thorough grounding in the principles of Classic architecture is of the greatest use, and enables the student more easily to adopt other styles which come up for a short time, and then, as it were, pass away.

Understand, I do not complain of the use of these sensational productions, but I consider that they are not suitable as a basis for the education of the student. No doubt they suit the present taste of the public, but the impression is not lasting, and to my mind there is a loss of boldness which detracts from the dignity of building. The use of large quantities of ornament is low relief and small and thin things attracts attention to parts of the building but not to the building as a whole. This year has for many years offered a prize for subject in connexion with Classic Architecture, but of late years the response has not been satisfactory and for the last three years there has not been awarded. I hope that it will be responded to this year in a more satisfactory manner.

I feel bound, however, to say here that I do not personally agree with the withholding of a prize when there is any response to it. When it is offered, I consider that it belongs to the student, and that it should be awarded (unless, of course, the response is a burlesque). The object of a student should not be criticised in the manner or with the same strictness as that of a body of experts in a competition for a prize. The object of giving prizes in competition by students is to encourage them to do work in their own time and to obtain information which will be useful to them afterwards, and to withhold the prize afterwards prevents the student, and possibly prevents him from trying a second time. I do not think of anything which would sooner discourage a youth who has done his best in doing a subject which others have fought for, than to be simply told that his prize was not of sufficient merit. Strictly speaking, I am well aware that the work produced by most of the students is not, in a conventional sense, worth the amount of the prize, but not, in my opinion, the question. The prizes are offered for the purpose of encouraging students to study and to work in their own time, which means they will gain knowledge and experience, and will also, by contact with others, improve their own abilities; and, personally, if I induce the student to read and think and to put his thoughts on paper, I should feel that money had not been wasted. Every care should be taken not to discourage a student at the commencement of his career, and I hope that those who have to examine the productions of the students during the coming session will bear this in mind.

There is one other matter to which I wish to allude shortly—the question of competitions. Unfortunately this seems to be a standing complaint

which comes before us each year, with its record of improper conditions imposed by committees, unjust decisions, and consequently time and money wasted in preparing drawings, and the remedy seems to be as far off as ever. Certainly, when I read some of the conditions now imposed, it is a matter of surprise to me that architects will compete. Amongst the conditions we find: that the committee 'does not bind itself to employ any of the competing architects to carry out the work'; that 'the whole of the drawings (however small the premises may be) shall become the absolute property of the committee,' &c. Then the accommodation required is given (generally much in excess of what may reasonably be expected for the amount proposed to be expended), and the amount to be expended also fixed. The result of the last condition very often is, that the architect is landed in a difficulty when he endeavours to obtain tenders, and the work passes into the hands of some other person at the option of the committee. So far as the work is concerned the professional assessors are at times ignored, the committee not being under any obligation to carry out his selection. The premium may be paid in accordance with his award, but the work goes to someone else who may have friends on the Board. This course acts very hardly on the striving architect who may have endeavoured faithfully to conform with the instructions. The carrying out of the work is, of course, the real object of the competitor so far as he is concerned, as the premium, in all probability, will but about pay costs out of pocket, and sometimes not even that.

The question is a very difficult one to deal with, especially so long as architects of position can be found ready and willing to enter into competitions on almost any terms. If leading architects would refuse to compete, excepting on fair and proper conditions, there might be some chance of obtaining better conditions, but until this is done, I really cannot see my way out of the difficulty.

MAGAZINES AND REVIEWS.*

THE *Gazette des Beaux-Arts* contains an article by M. Maurice Maindron on "The Armoury at Madrid," with illustrations of some grand helmets and other pieces of armour. The etchings of the two Tiepolos are treated of by M. Buisson. M. Marcel Reymond contributes an article on Jacopo della Quercia and his works, under the special heading "Florentine Sculpture," in which he draws attention to della Quercia's grand and severe treatment of the nude, especially illustrated by his bas-relief representing Adam tilling the ground. An interesting article by M. W. de Seidlitz treats of the subject of "La Propriété Artistique et la Contrefaçon," in which a good deal of curious information is given, illustrated by examples, as to what may be called the "stealings" of various engravers, and their tricks of introducing figures and accessories from the works of their predecessors and contemporaries, or of modifying and altering the compositions which they engraved.

The *Art Journal* commences an illustrated essay on Philæ, written and illustrated by Mr. G. Montbard, which will be of special interest at the present moment. The illustrations are beautiful, and the writer's indignation as to the proposed treatment of Philæ we, of course, entirely sympathise with; but it is unfortunate that he should spoil the effect of his remarks by his evident entire ignorance of the engineering question, and by speaking of the reservoir as "some ridiculous construction, some impossible dyke." That is the way people do mischief, and injure their own cause, by not knowing both sides of a subject. Putting Philæ out of the question, the proposed construction was neither "ridiculous" nor "impossible." An article on the lakes belonging to the Queen of Italy is accompanied by illustrations of some beautiful work. "Art-workers at Home," by Mr. F. Miller, deals with "Potters and Painters," with the work of Mr. de Morgan and of some of the artists who work for Messrs. Doulton.

The *Studio* is occupied partly with "Quebec as a Sketching Ground," illustrated by a good many architectural sketches there, by the author of the article, Mr. Goodhue. "A Painter in the Arctic Regions" is an interview with Mr. J. W. Stokes, illustrated from his pictures of arctic scenery.

* The object of these notes is to point out anything in the contents of the current magazine which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that is within our province to comment upon.

"Another Word about the Poster" is contributed by Mr. Arthur Fish, in reference to the work of the artists who adopt the name of "J. & W. Beggarstaff," whose object seems to be to reduce the poster as much as possible to a mere silhouette, suggesting a good deal, but defining nothing. It is possible, in time, to get tired of this.

The *Revue Générale* contains a chapter from Ruskin's "Seven Lamps," translated into French by M. O. G. Destrée. The translator makes no pretence to regard Ruskin as a great critic in art; he considers that his works want precision and clearness, and are full of contradictions, but he translates him for French readers as one who has had a great influence on English contemporary art. The chapter selected is "The Lamp of Memory."

There is remarkably little of artistic or architectural interest in the literary matter in either the *Century* or *Harper* this month. The illustrations by Mr. Pennell to a paper on the Norfolk Broads, in the *Century*, may be mentioned as of exceptional beauty as examples of book illustration.

In the *Atlantic Monthly* Mr. Peabody continues his interesting series of papers on "An Architect's Vacation," the present one (the third of the series), giving the author's remarks on Venice.

In *Scribner* Mr. H. C. Banner gives an illustrated article on "American Posters" (pictorial advertisements) past and present, with a number of illustrations; the subjects of French and English posters having been previously treated and illustrated in the same magazine. The chronologically progressive illustrations are worth looking at, as they furnish an interesting example of the development of what may now be called a special type of art, from the confused and ill-designed pictorial posters of the earlier days, when the object was merely to make something sensational with little regard to decorative effect, to the examples of the present day, in which the aim is to set forth a leading idea in a conventionalised and decorative manner, generally by means of a single carefully-designed figure with symbolical accessories. When, however, the writer claims that the examples of this latter class represent something purely American, we must differ from him absolutely. Their whole style is completely French, and would never have been achieved but for the influence of French examples; it may be patriotic, but it is absurd, to pretend otherwise. The paper on "American Wood Engravings" deals with the work of William Miller, a native of New York, but educated in Germany. Is it quite fair in that case to claim him as an "American" wood-engraver? An artist surely belongs, artistically, to the country which gave him his art training. Mr. Miller has worked chiefly at landscape engraving, and has aimed at his effects by avoiding fineness of line, and treating his subjects in the broadest manner possible. The example given of his work, "On the Coast—Moonlight," from a painting by Mr. Winslow Homer, does not impress us very favourably in regard to detail of execution, though the general pictorial effect is well conveyed.

In the *Nineteenth Century* Mr. Clements R. Markham writes an article on the need for an antarctic expedition, which may be useful as demonstrating to general readers the real scientific necessity of such an expedition, which is probably not generally understood. The most important object mentioned by Mr. Markham is the magnetic survey, which is of such consequence to navigation.

In the *Fortnightly* Mr. Alfred Austin writes a pleasant reflective article about Rome—"A Roman Reverie," which is worth reading. Looking at Rome from a poetic point of view, he naturally complains of its having become too much of an archaeological museum. Speaking of the Forum, he observes—"Every scrap of excavated architecture, every shattered column, every bit of battered plinth and corroded entablature, has a name now, and it is all as spick-and-span as your own premises at home. At first you are aghast, and ask if it would not have been better, more reverential, more conformable both with art and archaeology, to leave at least a few wrinkles on Rome's old and venerable face." But he admits that the history of the place has received notable elucidation, and that perhaps the first feeling of dismay was too hasty.

In the *Pall Mall Magazine* Mr. A. B. Simpson gives, in an article on "Bell Tones," some interesting and not generally known facts on the nature and acoustic relations of the complex tones produced by bells; facts which are of importance

in regard to obtaining a harmonious effect with a peal of bells, and should have the attention of those concerned in ordering new peals. In the same magazine Mr. Grant Allen continues his papers on "Evolution in Early Italian Art," dealing especially in this paper with the treatment of the Magi in pictures of the "Adoration." The paper appears to be the concluding one of the series. The writer's final remark is, that the Madonna and Child, in Early Italian Art, are types of a comparatively simple and rigid species; the Adoration of the Magi, on the other hand, is the best type of a very varied and mutable composition.

The *English Illustrated* contains an "interview" article on M. Caran d'Ache, whose portrait at the head of the article suggests the idea of a military man of the best type, rather than a caricature artist. There is a delightful humour in the four studies of "Bibliomania" given as an example of his work. Mr. Grant Allen—who seems to have taken seriously to the study of Italian painting, has a short article on Francia's "Madonna and Child with St. Anne" in the National Gallery, going into suggestions as to the reasons for the grouping of the picture, and the introduction of St. Sebastian. An article on "The Steeple Jack" by Mr. Wilfred Wenley, which professes to be the result of an interview with a professor of this business, may be interesting to architects, if it is to be accepted as genuine experience. Unfortunately, we have rather a scepticism about articles of this kind, which we are inclined to think are not infrequently made up by a literary imagination, though there is nothing in this one that may not be true.

Le Monde Moderne contains no less than three articles dealing with architecture and illustrations of buildings; one on Athens, one on Chartres, a long article very fully illustrated, and one on "La Grand-Place de Bruxelles." This latter contains not only illustrations of existing buildings, but several reproductions of old elevation drawings of the buildings as originally projected. An article on "Les Vins du Médoc" is interesting also in an architectural sense, as giving some description and illustration of the modes of storing the wine, and of some of the old buildings connected with the district; and an article on "Blanchissage Moderne du Linge" is also of interest to our readers, as it contains a full description of the processes in a great French laundry establishment, with plans of the building and views showing the arrangement of several of the departments. There are other articles of considerable interest not coming directly within our province, besides a fine little dramatic poem. *Le Monde Moderne* ought to have attention in this country, for it is one of the best and most interesting illustrated "monthlies" now published.

In the *Engineering Magazine* Mr. W. Stevenson considers the causes of the existence of "Uninhabitable Houses in City Slums"; and a translation is given of a valuable paper by Frederick Siemens, read at the eighth International Congress of Hygiene, on "Illuminating Gas for Heating Purposes."

The *Antiquary* contains articles on "Selmerston Old Church, Sussex," and on "Wayside Crosses on the Wolds, East Riding," by the Rev. E. Maule Cole; both illustrated from photographs. Selmerston is an interesting little church, with wooden columns. The crosses of East Riding are, unfortunately, for the most part only bases, but they are of interest nevertheless.

The *Reliquary and Illustrated Archaeologist* (Quarterly) contains an article on "Some Hebridean Antiquities," by Mr. David MacRitchie, and the first of a series on "Old Stone Crosses of Somersetshire," by Mr. Alexander Gordon.

The *Windsor Magazine* contains an illustrated account of the art collection at Nottingham Castle.

We have received the first number of *The Country House*, a monthly magazine containing a good deal of pleasant writing on rural subjects, intermixed with short stories by good writers, and one or two practical articles, such as "Making a Pasture," by Sir J. B. Lawes. The magazine is, moreover, well illustrated.

As the "Autumn Fashion Number" of a small periodical called *The Happy Home*, apparently a ladies' journal, has been sent to us, we may offer a word in season on a subject which is not strictly within our province. The first condition of happiness is health, and there can be nothing more injurious to health than the pinched-in dresses of the kind illustrated in an even exaggerated fashion in the pages of *The Happy Home*, which are, besides, as offensive to the eye of the artist as to that of the doctor.

Let the periodical in question commence by illustrating and recommending a more healthy and less ugly style of dress—it will then have a better claim to its title.

THE LONDON COUNTY COUNCIL.

THE weekly meeting of the London County Council was held on Tuesday, at the County Hall, Spring Gardens, Sir Arthur Arnold, the Chairman, presiding.

New Street from Holborn to the Strand.—Mr. Remnant presented a petition from the inhabitants of Holborn in favour of the construction of the new street from Holborn to the Strand, with modifications of the scheme proposed by the Improvements Committee.

The Improvements Committee recommended the Council to apply in the next Session of Parliament for powers to carry the scheme into effect, and the Council now proceeded to consider whether the Standing Orders limiting the period for considering applications to Parliament should be suspended.

Lieut.-Colonel Ford protested against the suspension of the Standing Orders, and expressed the hope that the matter would be allowed to take its proper course.

Mr. McKinnon Wood (Chairman of the Parliamentary Committee) also opposed the proposition, because he felt the Improvements Committee were asking the Parliamentary Committee to undertake work which it was not practicable for them to do in the time at their disposal. The committee had not brought up a report with all the details prepared; on the contrary, they had brought up a report which bore on the face of it obvious marks of haste and incompleteness.

Mr. Boulnois, M.P., reminded the members that this scheme had been before the Council for years, and he sincerely hoped that the Standing Orders would be suspended in order that they might at once proceed to a discussion of the main question.

Mr. Henry Clarke considered that the opposition to the recommendation would have been perfectly reasonable had this improvement come before the Council as a new improvement, but as a matter of fact the subject had been before the Council for six years.

Mr. W. M. Thompson said the urgency of the improvement had been admitted for years, and the Progressive Party, who had been in a majority in the Council for seven years, had done practically nothing in the matter. Now it was proposed by a side-wind to defeat a great project demanded by London, and necessary for London.

Sir John Hutton repudiated the charge that the Progressive Party had any desire to obstruct improvements. This scheme differed essentially from others that had been submitted, and he held that it could not be properly considered between now and the end of November.

After further discussion the Council divided, when there voted—

For the suspension of the Standing Orders 65
Against 35

Majority for 30
A majority of at least three-fourths of the members present, or a clear majority of the Council, being necessary for the suspension of a Standing Order, the recommendation of the Committee was defeated.

The Widening of Ludgate Hill.—The Improvements Committee submitted the following report:—

"We brought up to the Council on May 2, 1893, a report upon an application from the City Commissioners of Sewers for a contribution towards the cost of acquiring the premises Nos. 1, 3, 5, 7, and 9, Ludgate Hill, and No. 1, St. Paul's Churchyard, with a view to the completion of the widening of Ludgate Hill, and we recommended the Council to contribute one-half of the net cost of the improvement, such contribution not to exceed the sum of £4,964. The Council, however, on May 16, 1893, passed the following resolution:—'That, considering that the ratepayers in the City are less heavily rated for the expenditure of the Council than the ratepayers in other parts of London, and that between the years 1886 and 1889 the City authorities received from the late Metropolitan Board of Works £72,794. 3s. 9d. out of a total of £75,471. 14s. 7d. contributed by that body towards the cost of local improvements (the annual charge resulting from which is still being borne by the whole of London), the Council is not prepared to contribute towards the cost of the City improvement referred to in the report.'"

We have since had before us a letter from the City Commissioners of Sewers asking the Council to reconsider its decision. The Commissioners point out that the improvement in question is the completion of a work commenced many years ago and carried out in sections, the Metropolitan Board of Works having agreed, as each section was completed, to contribute one-half of the net cost. With reference to the statement in the Council's resolution, 'that the ratepayers in the City are less heavily rated for the

expenditure of the Council than the ratepayers in other parts of London,' the Commissioners say that this is because the Corporation and Commissioners of Sewers have great cost, provided for in the rates, for the City court, artizan dwellings, &c., to which the remainder of the Metropolis has contributed nothing, and it would therefore be unjust for the City to be called upon to participate in the expenses for the rest of London unless the City's outlay were first reimbursed, in which case the ratepayers outside the City would find themselves considerable losers. The Commissioners further refer to the words in the reports of the years 1886 and 1889 the authorities received from the late Metropolitan Board of Works £72,794. 3s. 9d. out of a total of £75,471. 14s. 7d. contributed by that body towards the cost of local improvements, 'contending that during that period the Commissioners of Sewers expended on improvements no less a sum as £2,825,304. 1s. 6d., being many times more than the whole outlay of all the other local authorities of London for the same purpose, and that, whereas the outlay in other parts of the metropolis was only twice as much as the Metropolitan Board contributed, that of the City was five times as much.

The Commissioners also hold that the City being the oldest of London, and its streets the narrowest, improvements of the City have been more imperatively required, and that London benefits by the centre being made more accessible, which cannot be said in regard to any of the outlying districts. They also point out that the City of London, on account of its high assessment, contributes about one-eighth of the whole expenditure of the Council upon improvements in London, from many of which the citizens derive no benefit, and the Commissioners express the opinion that it will be hard, if after helping all the rest of London they are to be left unaided in carrying out City improvements, which are needed, not so much in their own interests as in the interests of the whole of London. For these reasons the Commissioners ask for a reconsideration of their application that the citizens may be assisted in carrying out the great improvement in question. After carefully reconsidering the whole question, we still of opinion that the widening of Ludgate Hill is a county improvement of such a nature as to justify the Council in contributing to the cost. In our former report upon the subject we stated that 'in accordance with the Council's resolution of November 26, 1889, the application of the Commissioners had been made to and considered by the Council, and the Council had agreed to contribute one-half of the net cost of widening Ludgate-hill at Nos. 1, 3, 5, 7, and 9, and at No. 1, St. Paul's churchyard, as proposed by the City Commissioners of Sewers, such contribution not to exceed the sum of £4,964."

That, subject to an estimate being submitted to the Council by the Finance Committee as required by statute, the Council do contribute, on the usual condition, one-half of the net cost of widening Ludgate-hill at Nos. 1, 3, 5, 7, and 9, and at No. 1, St. Paul's churchyard, as proposed by the City Commissioners of Sewers, such contribution not to exceed the sum of £4,964."

The consideration of this report was adjourned for a week, in accordance with the standing order of the Council.

Government Buildings and the Building.

—The Parliamentary Committee reported its representation had been made to the Government calling attention to exemption from London Building Act of any building, structure or work vested in and in the occupation of department of the Government or of the Metropolitan Police, and pointing out the expediency of bringing public buildings generally into compliance with the requirements of the Act as to lines of frontage, as well as with the general requirements of the law as regards drains and sanitary conditions, in the same way as buildings belonging to private owners. In reply, the Commissioner of Works, to whose department the letter was addressed, had informed the Committee that he had consulted the Treasury on the subject, and he pointed out that the Act of 1894 left the question one of administrative discretion, and that cases might arise when it might be essential that a public building should not conform strictly to the prescribed line of frontage. The First Commissioner added that, in applying this principle, the Commissioners of Works, while unable to waive exemption granted by statute, would endeavour to exercise it with discretion, and in the reasonable spirit. The Committee stated that they were still strongly of opinion that in the present interest the exemption should be removed, and that an interview with the First Commissioner might perhaps enable them to convince him of the desirability of the change. They, therefore, asked the Council to authorise them to request the First Commissioner of H.M. Works to receive a deputation on the subject, the deputation to consist of the Chairman and two members of the Building Act Committee, in addition to members of the Parliamentary Committee.

Dr. Longstaff asked that the recommendation should be referred back with the view to its being considered by the Building Act Committee.

Mr. McKinnon Wood (Chairman of the Parliamentary Committee) acquiesced.

Mr. John Burns hoped this course would only be adopted on the understanding that the main principle involved was not departed from. The Government, in his opinion, ought not to be allowed to depart from those regulations that the Council and the Local Authorities imposed upon private individuals.

Dr. Longstaff remarked that the Council was equally with the Government exempted from the conditions as to lines of frontage.

Boundary-street Improvement Scheme, &c.—The Public Health and Housing Committee reported as follows:—

"In pursuance of the authority given by the Council on July 23 and 30 last, we have opened the tenders received for the erection of the working-class dwellings on blocks B, G, H, and I, section B of the Boundary-street scheme, and for the erection of Idenden Cottages, East Greenwich, under the Blackwall Tunnel scheme. The tenders were as follows:—

Boundary-street.

Block B—G. E. Todd	£10,100	0	0
Holloway Bros.	10,577	0	0
W. Shurmutt	12,000	0	0
Block G—Holloway Bros.	3,586	0	0
J. Jarvis & Sons	4,061	0	0
W. Shurmutt	4,500	0	0
Block H—Holloway Bros.	6,246	0	0
T. H. Kingerlee	7,409	7	9
W. Fortescue	7,426	0	0
D. J. Charlton	8,010	0	0
Block I—G. E. Todd	6,220	0	0
Holloway Bros.	7,817	0	0
W. Shurmutt	8,500	0	0

Idenden Cottages.

Holloway Bros.	£13,803	0	0
Kirk & Randall	14,921	0	0
G. E. Wallis & Sons	15,500	0	0
Richard Heath Walker	16,372	0	0
	26,051	5	2

We have accepted the tenders of Mr. G. E. Todd for the erection of Blocks B and I, and the tenders of Messrs. Holloway Bros. for blocks G and H and for Idenden Cottages, and the works are now in progress. We submit a plan (which will be hung up in the Council chamber) showing the progress of the works on the Boundary-street area. Dwellings are already erected on section A, and are now fully occupied—works are in progress on blocks A, B, G, H, and I, on section B, and the buildings are commenced on a portion of section E.

We considered it desirable that a clerk of works should be employed in connection with the dwellings on the portion of section E of the Boundary-street area, which are being erected under the supervision of Mr. Rowland Plumble. The Council on our recommendation adopted this course with respect to other buildings, and we have therefore instructed Mr. Plumble to appoint Mr. W. Finney, at the wages of 34 s. per week. We recommend—

"That the course taken be approved."

We report for the information of the Council that the Home Secretary has signified his approval of the Council itself erecting dwellings for persons of the working class on the remaining sections of the area, viz., sections C, D, and E. We have instructed the architect to submit plans of the dwellings for sections C and D, and the remaining portion of section E, yet to be dealt with, as soon as possible. The Act directs that the scheme shall be advertised for three consecutive weeks during the months of September, October, or November, and for this reason we did not refer to the Council earlier in the year."

Mr. Boulnois, M.P., asked if the tenders were open by the Committee, or by Mr. Bruce, as Chairman.

Mr. Bruce replied that the tenders were opened by a Sub-Committee appointed by the Committee.

Mr. Boulnois said he had implicit confidence in the Chairman of the Public Health Committee, but he did not think the duty of opening tenders should be delegated to any Sub-Committee. He wished, however, to call attention to the figures given in the report. The Works Department, when the Architect's estimates were sent to them, said they could not carry out the work at the amounts stated, and yet in nearly every case the contractors were able to do the work at a little above or a little below the estimates of the Architect.

Mr. Burns asked whether the Committee felt justified in proceeding with the other blocks after their experience of the unsightly character of the block already erected.

Mr. Bruce said there was general disappointment at the result, but the respective drawings were submitted to the inspection of the Council at the outset, and no remarks were made upon them.

The Committee's recommendation was agreed to.

Millbank Prison Site.—The following report was submitted by the Public Health and Housing Committee:—

"It will be remembered that the Council agreed to purchase about 10 acres from the Government for the purpose of housing persons of the working class, under Part III. of the Housing Act. One of the objects of this part of the Act is that the Council shall itself erect dwellings either through a contractor or otherwise. It is of great importance that work should be commenced at once. The final sale to the Council is not yet fully completed, but it is understood that we have permission to commence laying out the area. The Council on July 2 last, amended and referred back to us the following recommendation in our Report on the question of obtaining plans for the laying out of and the erection of buildings on the

site.—That the Committee be authorised to employ a specially qualified architect or architects to design the laying-out of the Millbank Prison site, and to prepare the plans of the buildings to be erected thereon. Having again given careful consideration to this matter, we are of opinion that the views of the Council will best be met by the Council entrusting the laying-out of the site to its own Architect, and authorising us to employ an architect or architects to design the buildings should it appear to us desirable to do so.

We recommend—

"That the Council's Architect be instructed to design the laying-out of the Millbank Prison site, and that the Committee be authorised, if it should think fit, to engage the services of an outside architect or architects for such of the buildings as the Council shall determine to erect upon the site."

Lieut.-Col. Ford remarked that the Committee proposed to leave to the Council's Architect the laying out of the site, but it had no confidence in him to do the work. This, he considered, was a great slur upon Mr. Blashill, who was a thoroughly qualified architect, and one of their most capable officers.

Colonel Rotton moved, as an amendment, that the matter be referred back. He said the proposal originally was that the Council should employ an outside architect for the laying out of the site, and the erection of the buildings; now the Committee said they did not want an outside architect to lay out the site, their own Architect could do that, but they wanted an outside architect to carry out the erection of the buildings. This was a very small concession, and undoubtedly it was a slur on Mr. Blashill, who, as the Architect of the Council, should superintend all their work.

Mr. Beachcroft stated that the recommendation was merely in the nature of a compromise. Mr. Blashill was overworked, and was not able to carry out these large undertakings so far as the superstructure was concerned at Millbank, which meant an expenditure of no less than 250,000l. He contended that there was no slur cast on Mr. Blashill in the recommendation.

After some further discussion, the amendment was rejected and the recommendation of the Committee approved, the words "to submit the name or names" being substituted for the words "to engage the services."

Water Companies' Regulations.—On October 9, 1894, the Public Health and Housing Committee reported to the Council the result of their correspondence with the London water companies with regard to the alterations which the Council had asked them to make in their regulations under the Metropolitan Water Act, 1871, and, in view of the refusal of the companies to make the most important alteration suggested, viz., to increase the maximum capacity of water-closet flushing cisterns from two to three gallons, and of their failure to alter the regulations in the other points suggested, the Council decided to ask the Local Government Board to appoint a person of engineering knowledge and experience to report to them on the subject, as provided for in Section 19 of the Act. The Committee had now to report that the Board had appointed Colonel Ducat, R.A., one of its engineering inspectors, to hold an inquiry, which will take place on October 31. As it might be necessary to retain counsel, to obtain the evidence of experts, and otherwise to incur expenditure in supporting the Council's views on this important question at the inquiry, the Committee recommended—

"That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Committee be authorised to expend a sum not exceeding 250l. in connexion with the inquiry."

The recommendation was approved.

Sanitary Inspectors.—The Public Health and Housing Committee reported that the Local Government Board had sanctioned the following appointments and re-appointments of Sanitary Inspectors, viz.:—Appointments of Messrs. Ensor, Bartlett, and Green in Clerkenwell; Mr. P. Shelley in Greenwich; Messrs. Bagshaw, Irving, Metcalf, and Mernagh in Islington; Miss Rose E. Squire in Kensington; Mr. J. F. Charlesworth in Lewisham; and Messrs. Biorn, Golds, and Potter in Paddington. Reappointments of Messrs. Freeman and Bennett in Holborn; Mr. H. F. Bridel in Kensington; and Mr. F. E. Butcher in Lewisham. One-half of the salaries of these officers is payable by the Council in accordance with the provisions of the Public Health (London) Act, 1891.

Churchway (Somers Town) Area.—The consideration of the scheme for dealing with the Churchway (Somers Town) area was postponed. The scheme deals with the houses in Churchway, Wellesley-street, Elizabeth-court, and York-buildings, and provides for the formation of a 40-ft. road along the existing line of Churchway, widening

on its western side from Grafton-place to the Drummond-street, and thereby converting three *cul-de-sacs*, viz., Grafton-place, Wellesley-street, and Lancing-street, into thoroughfares. The estimated cost of acquiring the properties is 52,000l. It is anticipated that there will be a recoupment amounting to 6,800l., leaving the net cost of property 45,200l. The paving works are estimated to cost 6,450l., so that the total net cost of the scheme is estimated at 51,650l. By the arrangement made with Lady Henry Somerset the Council will be relieved of all expenses in respect of her property dealt with by the scheme. The estimated gain to the Council effected by the co-operation of Lady Henry Somerset is 12,500l., which reduces the total cost of the scheme to the Council to 39,150l. net. The total number of persons who will be displaced is 1,086, and accommodation for about 568 persons can be provided on the cleared area—viz., 348 on the east side of Churchway, and 220 on the west side.

Strand Insanitary Area.—The Public Health and Housing Committee called attention to the insanitary condition of an area lying immediately north of the Strand, adjoining Clare Market and the southern end of Drury-lane, and expressed the opinion that the narrowness, closeness, and bad arrangement, and bad condition of the houses, courts, and alleys within the area, and the want of light, air, and ventilation were injurious to the health of the inhabitants, and that the evils connected with these houses, courts, or alleys, and the sanitary defects in this area could not be effectually remedied otherwise than by an improvement scheme. The Council's officers had prepared a scheme, the details of which are as follows:—

"It is proposed to include in the scheme all the properties within the represented area, and also the property in Kemble-street and at the corner of Holles-street and Stanhope-street which is not referred to in the representation of the Medical Officer of the district, but which is included to enable the Council to improve the rehousing area and close the whole of Holles-street, and so obtain a much better building site than otherwise would be possible. In this, as in all schemes, the difficult question of re-housing a portion at least of the persons displaced by the scheme has to be faced; and to this question we have given very careful consideration. The experience which we have gained of late years shows that but a very small proportion of the actual persons displaced from insanitary courts and alleys by housing schemes can be induced to avail themselves of the accommodation supplied for them in the new buildings erected for that purpose. This arises from the fact that the areas cleared in housing schemes consist of the worst form of slums, and that people living under these conditions are not at once prepared to accept the more stringent regulations required in improved sanitary dwellings. There are always, however, plenty of persons, living under somewhat better conditions than those of the slums in question, who eagerly appreciate the sanitary improvements to be found in dwellings provided by the Council, and these persons, by removing to the new dwellings, make room in their turn for those displaced from the courts and alleys which have been destroyed. On the land which the Council is about to acquire at Millbank, dwellings capable of accommodating more than four thousand persons can be erected. It will be remembered that one of the considerations which induced the Council to undertake the purchase of the Millbank prison site was that the Home Secretary agreed that dwelling-houses built thereon should be considered as accommodation supplied for persons displaced by any scheme within two miles distance. The Strand area in question falls within this limit. The total number of persons to be displaced is 3,028. Of this number there is a certain proportion, such as porters at Covent-garden market, persons employed at theatres, &c., whose occupations necessitate their living in the vicinity. For this class of persons we propose to make provision to the extent of about 500 on the area, and in this connexion it is proposed to widen Drury-lane on its eastern side to 40 ft. so far as the property taken extends. With regard to the remainder (about 2,528) it is proposed to supply accommodation for one-half (about 1,264) on the Millbank prison site, in accordance with the permission of the Home Secretary."

The estimate of the cost of the scheme is as follows:—
Net cost of property.....£214,250
Estimated cost of paving, &c., works.....2,250

Total net cost.....£216,500."

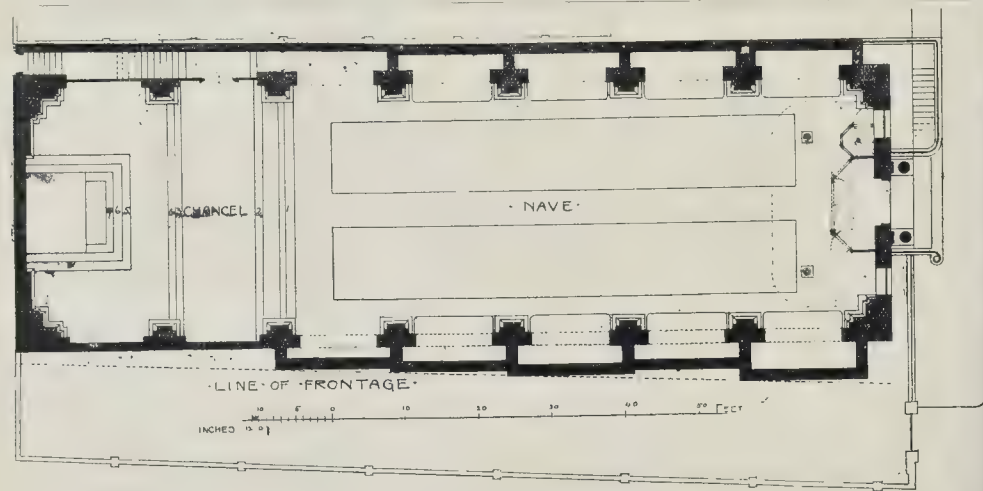
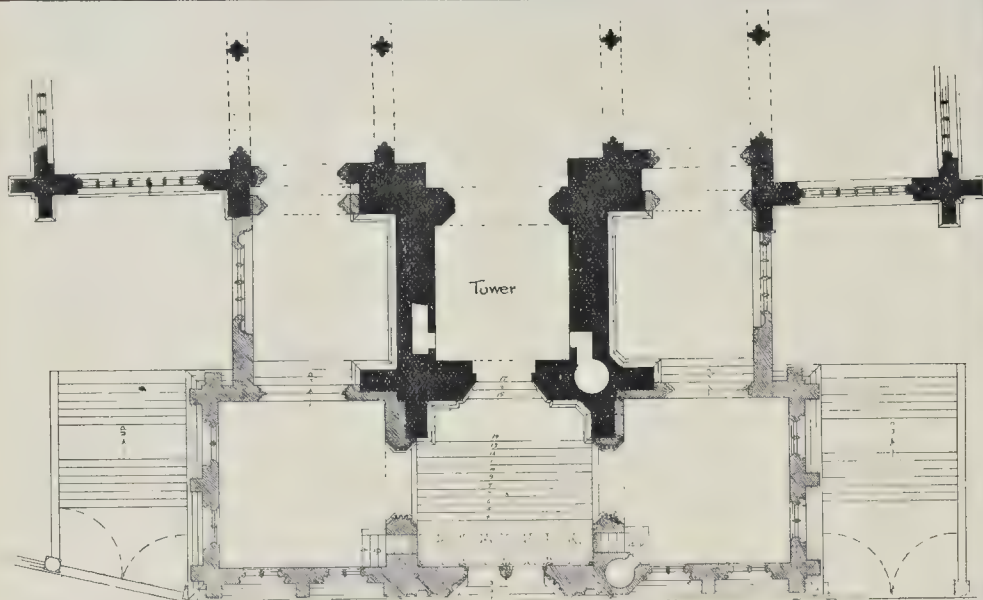
The consideration of the subject was adjourned for a week.

After the transaction of other business, the Council adjourned.

COMPETITIONS.

HOSPITAL FOR BOWNESS AND WINDERMERE DISTRICT.—The united committee of the Bowness and Windermere District Councils have selected the plans sent in in open competition by Mr. Robert Walker, architect of Windermere and Lancaster, for a joint hospital for the district.

DERBY.—The Special Purposes Committee of St. Thomas' Church, Derby, have selected the design of Mr. F. W. Dixon, of Guardian Buildings, Manchester, and Union-street, Oldham, submitted in open competition, for proposed new



Parish Hall and Sunday-school. The selected design shows a Late Gothic treatment in red brick and terra-cotta, with a rich tracery window in terra-cotta towards the main road. The coping to gables, &c., will be in Matlock stone; whilst the inside joiners' work will be in selected pitch-pine, and the windows glazed with leaded lights. A combined system of heating and ventilation will be adopted upon a low-pressure basis. A caretaker's house is also included in the scheme.

Illustrations.

PROPOSED WEST FRONT, MANCHESTER CATHEDRAL.

THIS design, by Mr. Basil Champneys, the drawing of which was exhibited at the last Royal Academy, has arisen in part out of the changes which it is proposed to make in the treatment of the site of Manchester Cathedral. The roadway in front of the cathedral, which is at present oblique in regard to the building, is to be widened and its boundary run parallel to the west front of the cathedral. It has

been proposed at the same time to lay out the cathedral precinct with grass lawns and specially laid-out walks. The proposed front would serve to bring the line of the building up to the street, making a great entrance porch immediately accessible, and at the same time give greater breadth and importance to this portion of the building, substituting this wide elevation for the narrow tower.

The work is not yet carried out, but it seems probable that it will be.

CHURCH, UPPER CHEYNE ROW, CHELSEA.

THE "Church of Our most Holy Redeemer," Upper Cheyne-row, Chelsea, is to be opened by Cardinal Vaughan on October 23. It has been built for the Very Rev. Canon C. Keens, by Messrs. Goddard, of Farnham and Dorking, from the designs and under the superintendence of Mr. Edward Goldie, architect, of London.

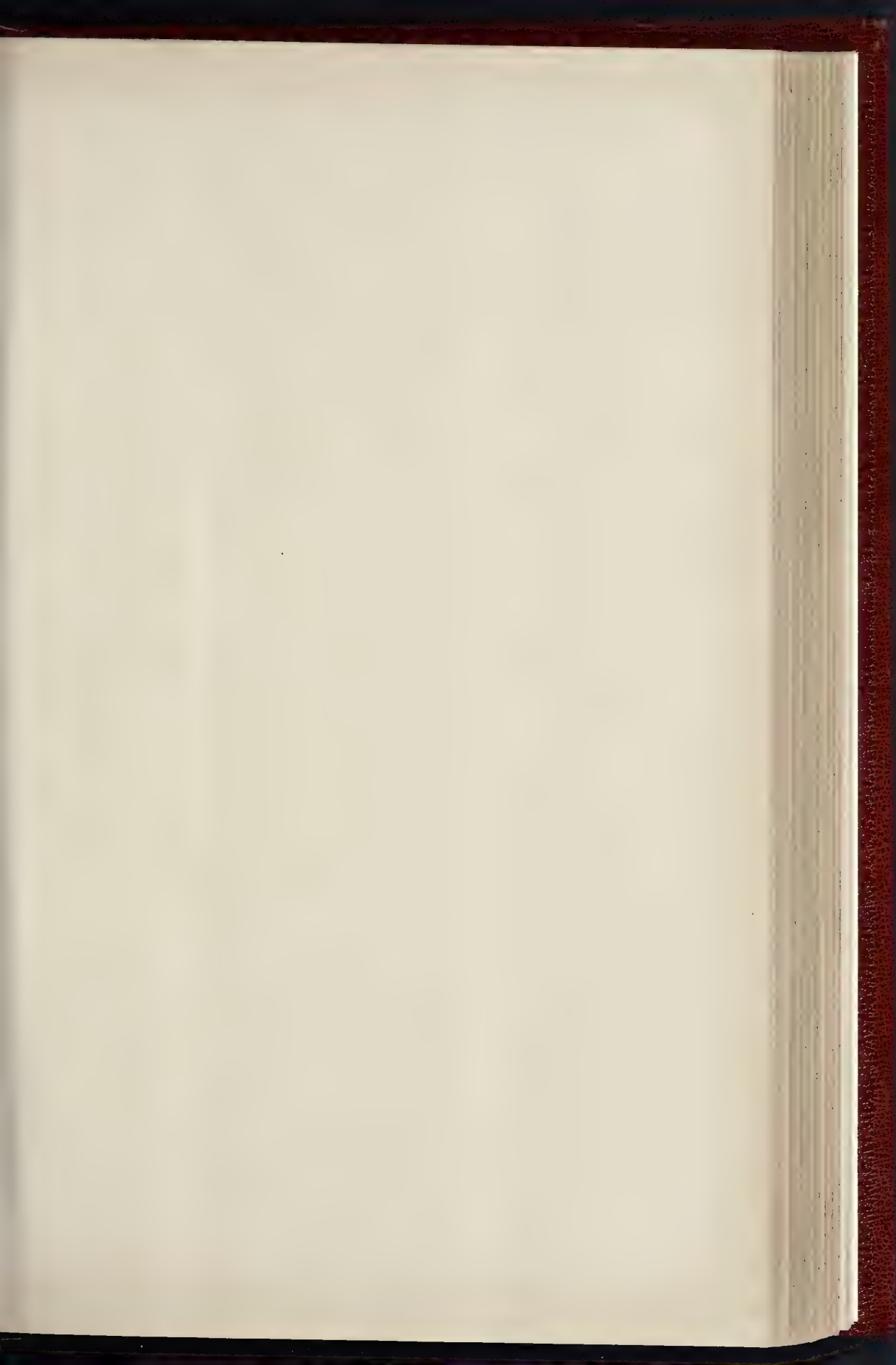
The foundation-stone was laid by the Cardinal on June 7, 1894.

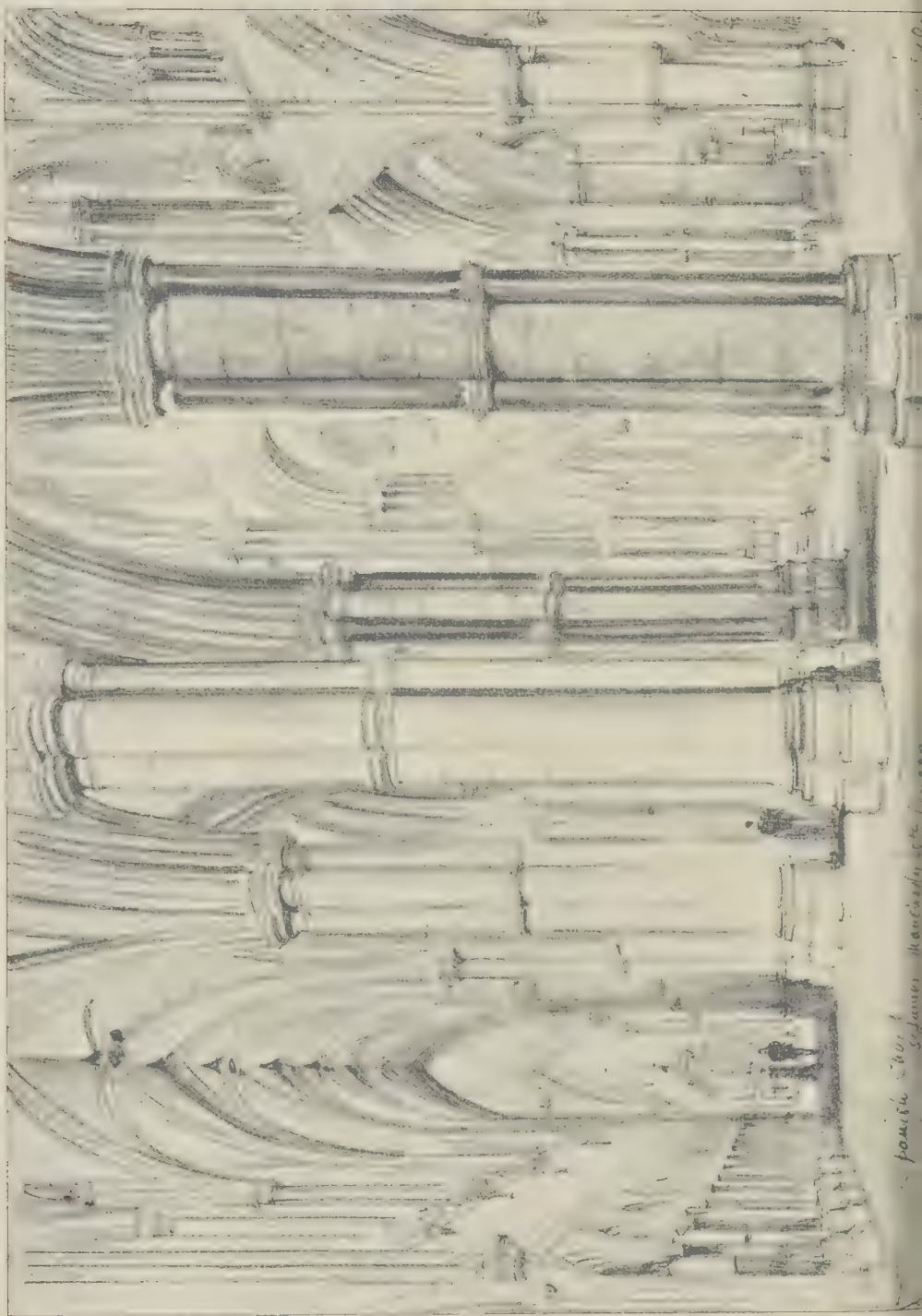
The church is Italian in style, of an English type, somewhat after the manner of our City

churches, and is 115 ft. long internally and 34 ft. wide across the nave; the height is 42 ft.; this width across the chapels is also 42 ft. This would have been greater but for the proposed widening of the side street. The material outside is red brick with Bath stone dressings, inside plaster with Bath stone plinths to the pilasters, the ceiling being coved and ribbed. The wood-block floor is laid by Messrs. Duffy, the heating done by Messrs. Grundy, and the electric lighting is by the Westminster Electric Installation Company. The roof is covered with lead. There is a gallery at the west end, with a balustrade in front and a spiral stair, all worked in kauri pine. The sacristy is under the chancel, a side stair leading to it; under the west end is the heating chamber. The drawing from which the illustration is taken was hung in the last Royal Academy exhibition.

ST. JAMES'S CHURCH, SPANISH PLACE.

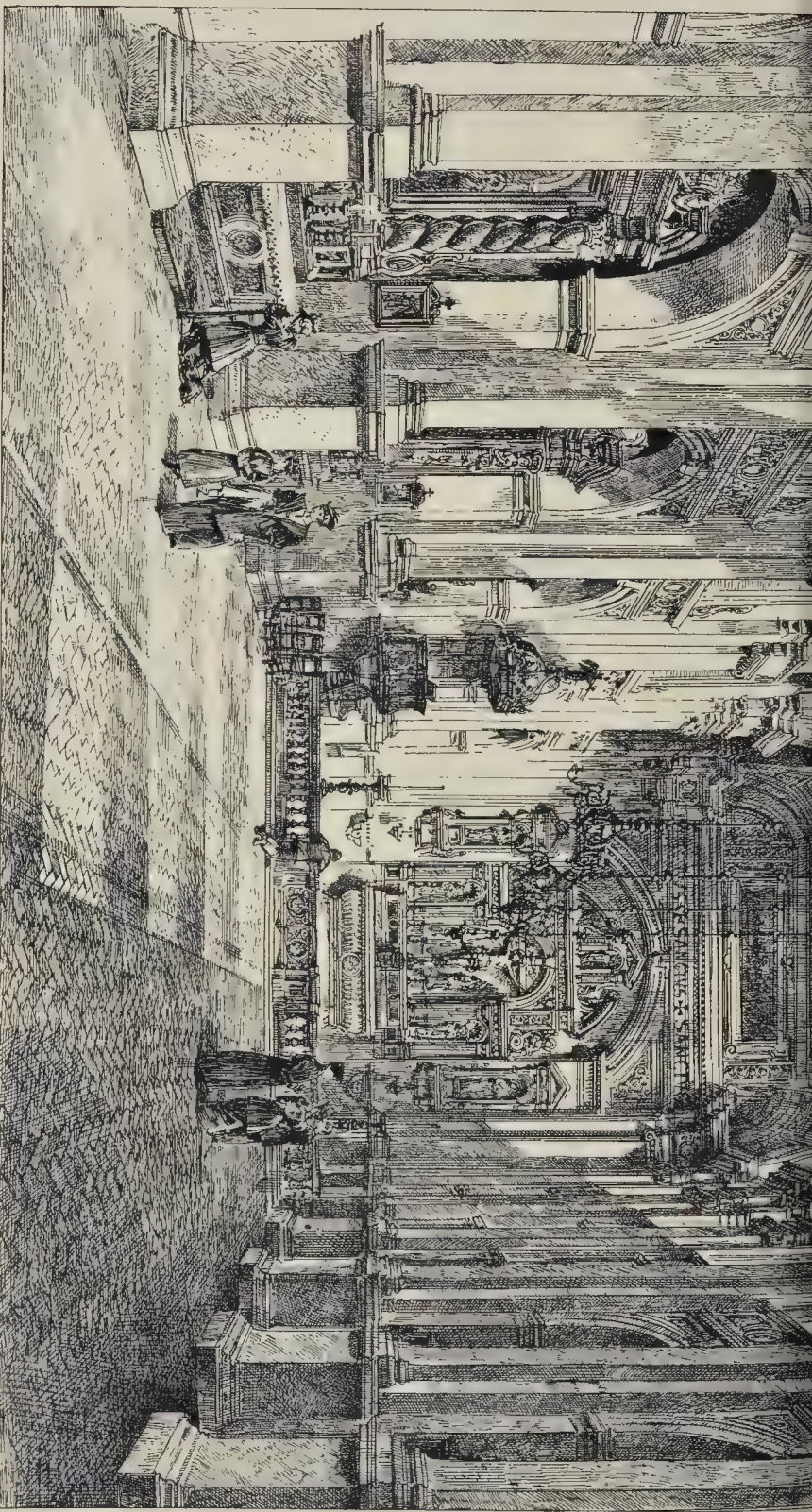
THE church, which was erected from the designs of Messrs. Goldie, Child, & Goldie, as the result of an important competition held in the



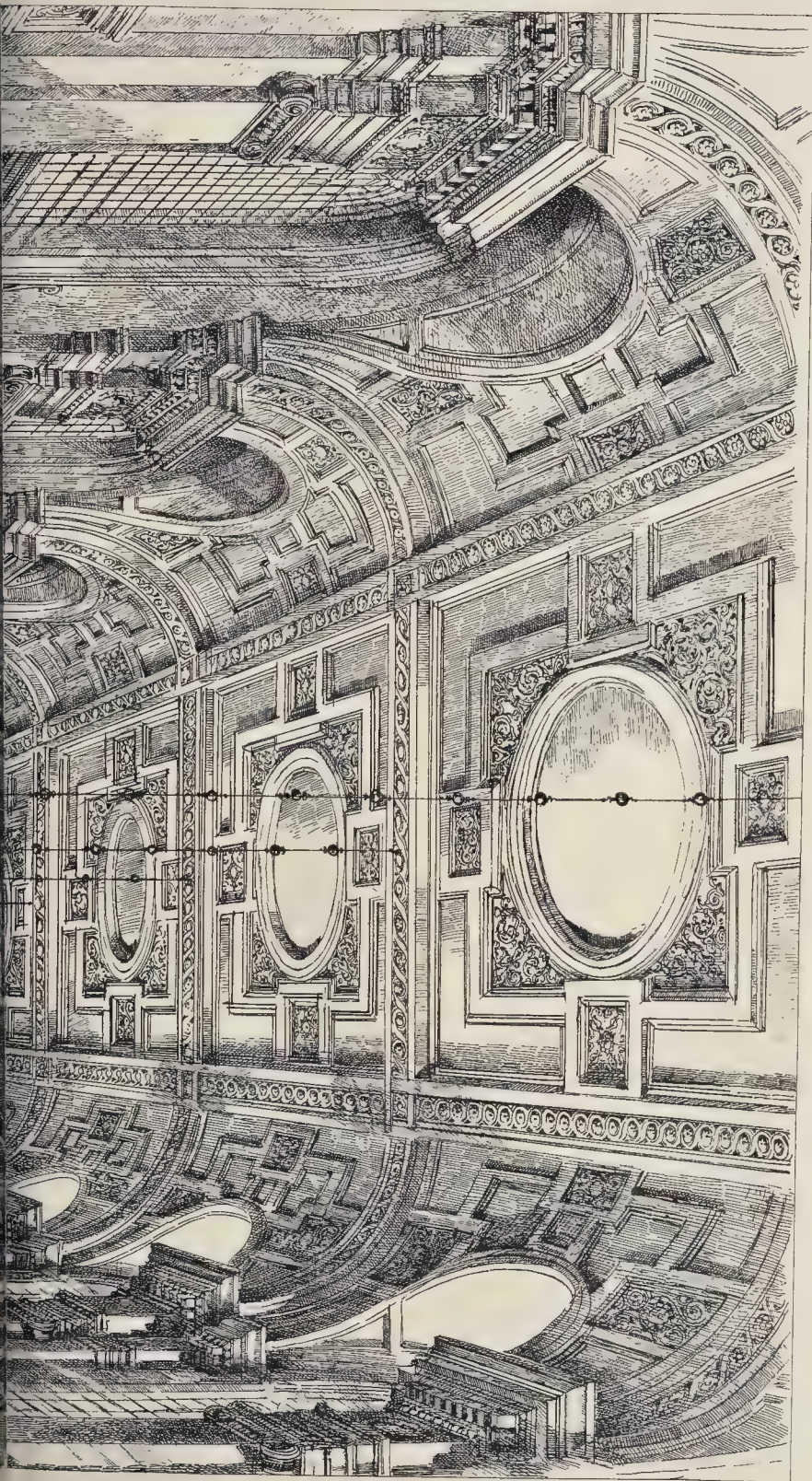


Pointe St. Jean, Montebello, N.Y.

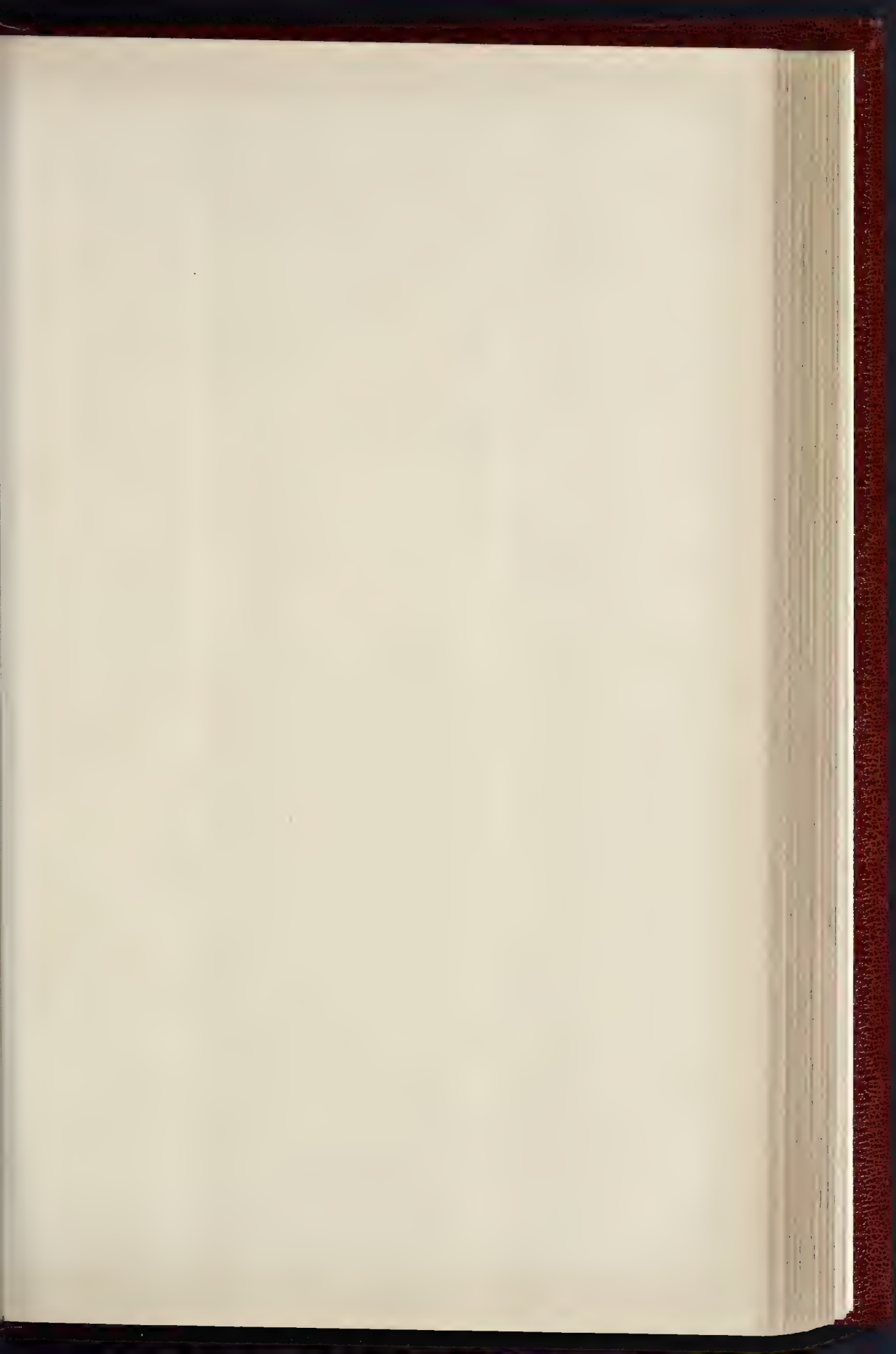




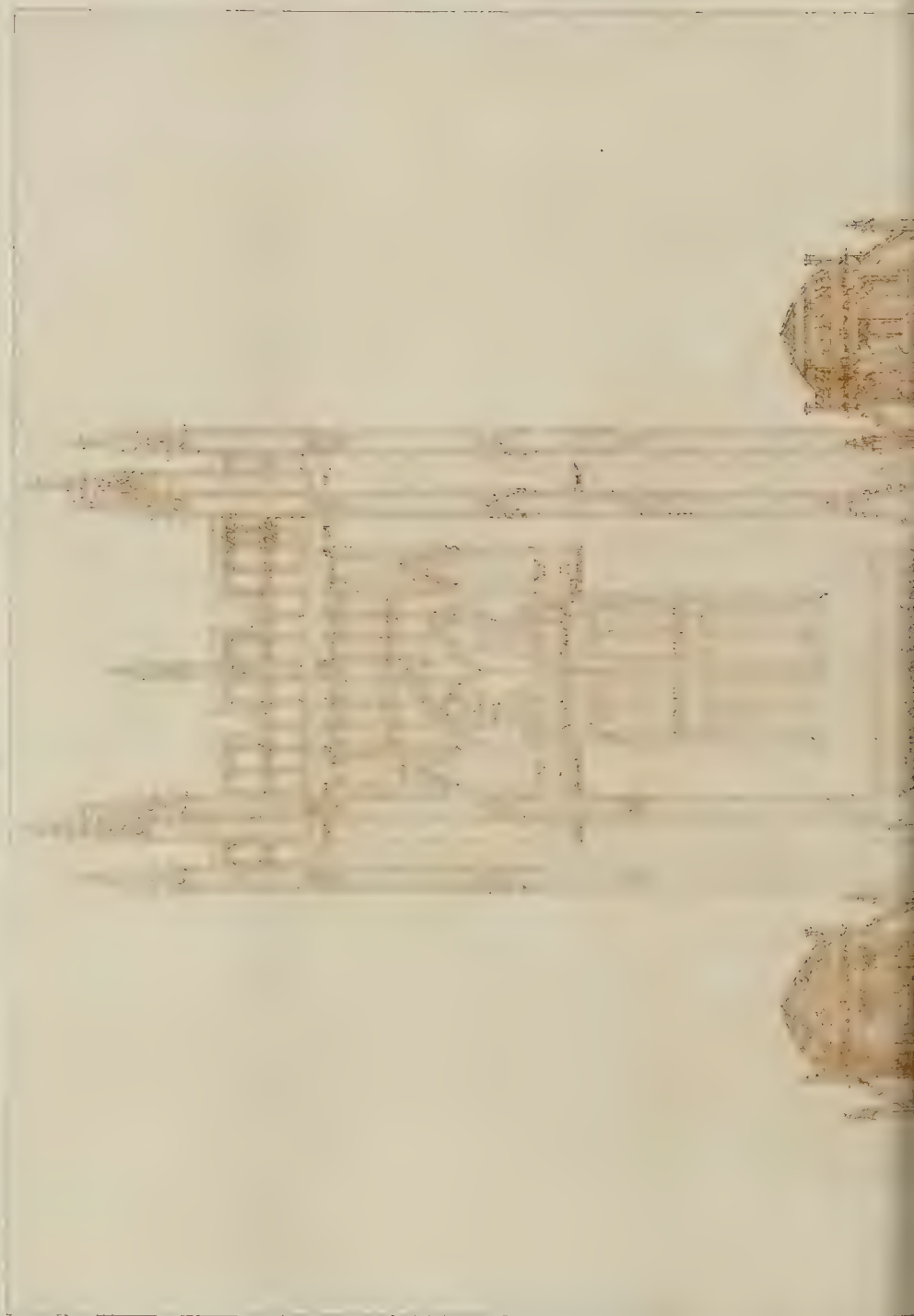
CHURCH OF THE MOST HOLY REDEEMER, CHELSEA. INTERIOR VIEW. MR. E. GOLDBE, ARCHITECT.

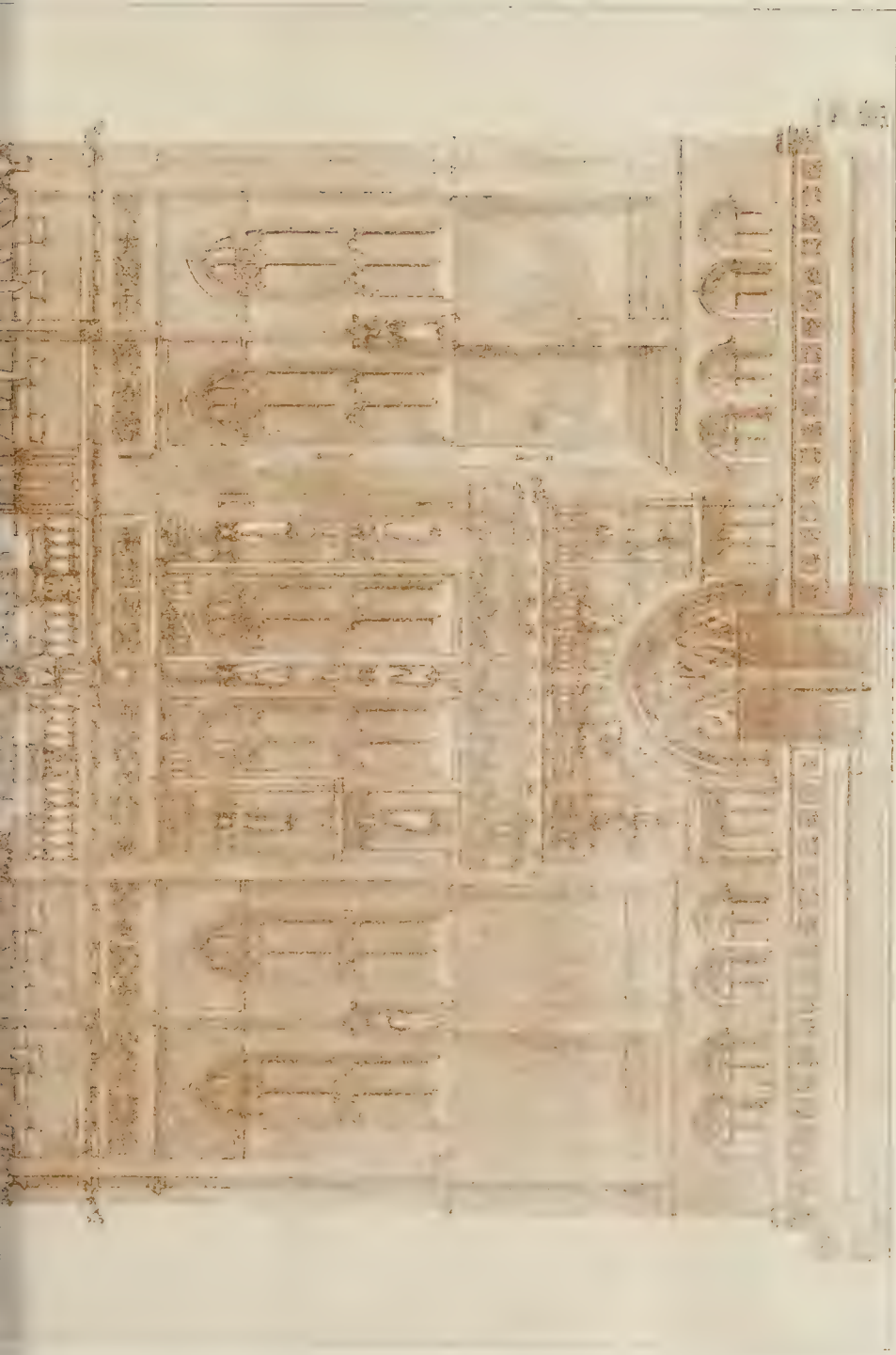


THE BUILDER, OCTOBER 12, 1895



THE BUILOFR, OCTOBER 12, 1895.

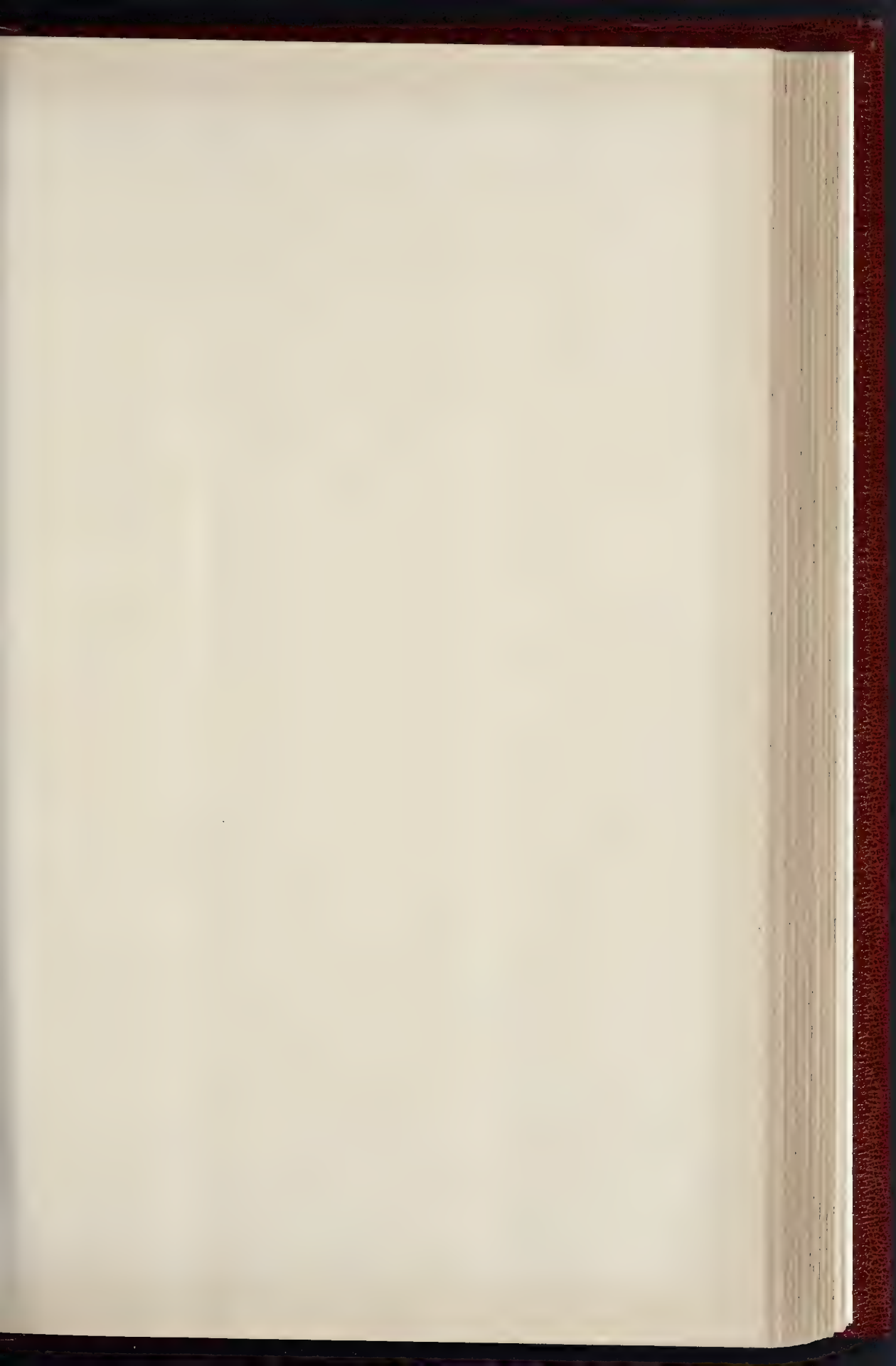


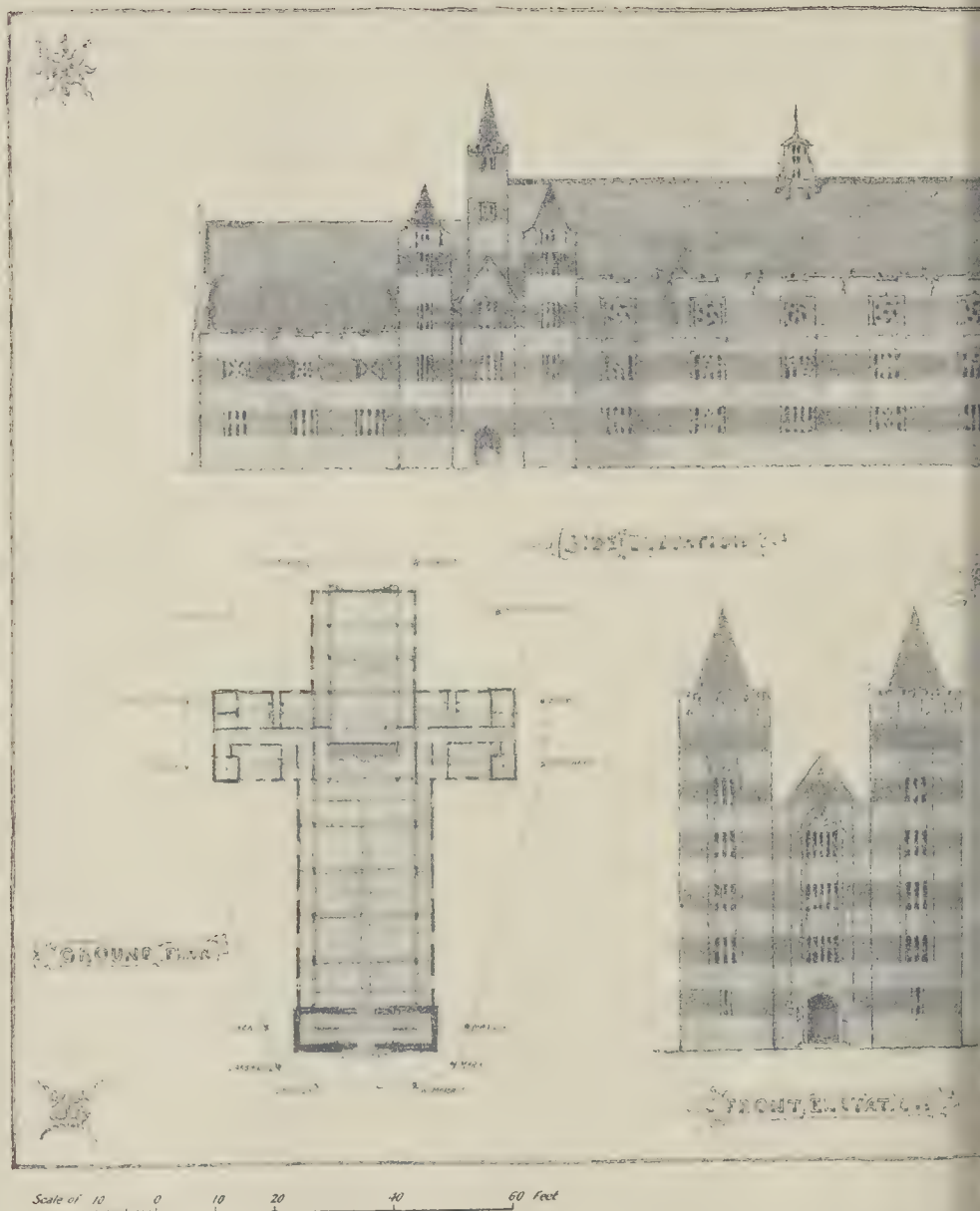


PROPOSED WEST WING, FRONT, MANCHESTER CATHEDRAL. MR. BASH CHAMPAGNE, ARCHT.

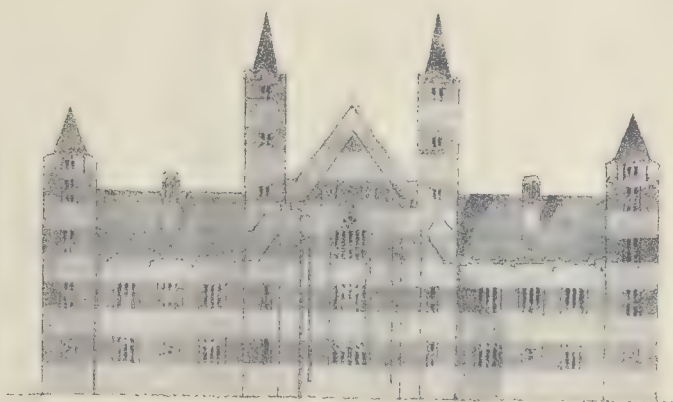


CH OF ST. JAMES, SPANISH PLACE - VIEW OF NAVE FROM CHANCEL.—MESSRS GOLDIE, CHILD & GOLDIE, ARCHITECTS.





1895.



CHURCH

INDICATION



GALLERY

CROSS SECTION



BY PHOTOGRAPHY OF THE EAST HALL - ST. LEO'S CATHEDRAL - L.A.



Monkwearmouth Church. From a Photograph.
(See p. 189.)

1885, has been before illustrated in our columns, but not from the points of view shown in Brewer's two sketches. The design gave a full review of the competition under date July 18, 1885, and a view of the superior design in our issue of August 1 of the year.

DESIGN FOR A LABOUR CHURCH.

The design, exhibited in the Royal Academy, seems to suggest a new idea in regard to church building; the provision of a plain and unadorned building especially for artisans. Attention is emphasised by the provision of a line of the boundary-wall for the use of eminent socialists or champions of the cause; an idea which will, we fear, seem rather alien to most English people, as introduced in connection with a church. The design, however, represents a new idea in church building, in that one sense, and as such is worth notice.

ENGINEERING SOCIETIES.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—On October 2 the members of the society visited the new and old works of the East London Water Company at Waltham. The existing reservoirs belonging to the company cover an area of 220 acres, and the line of the reservoirs is ten miles in length. The new works, company under their Act of 1894 consist of the construction of two large reservoirs, the raising of the old racecourse reservoir to a height of 20 ft., so as to enable the depth of the reservoir to be increased to 20 ft.; the water area equal sixty-five acres. 3. The construction of a new road; and 4. The construction

of filter-beds and high-service covered reservoirs. The two new reservoirs are being constructed by Messrs. John Aird & Sons, and the water-area of these will equal eighty acres; the depth of water in them will be about 20 ft. They will be connected with one another by means of tunnels, and the flow of water between them will be regulated by valves. The additions to the Racecourse Reservoir are being carried out by Messrs. Kirk & Randall, and this latter work will be completed in about a month's time. The contractors will have executed the work two months under their contract time. There are three filter-beds at this station, also a deep well into the chalk, the water from which is lifted by a differential pumping engine. A new triple expansion pumping engine and new centrifugal pump and engine will be erected here, the latter pump being capable of lifting 50,000,000 gallons a day. Other works are designed and will be carried out as early as possible. Mr. Randall, one of the contractors, Mr. Taylor, who represented the engineer, Mr. W. B. Bryan (who was engaged at the Hackney Inquiry), and Mr. McPherson, the manager of Messrs. John Aird & Sons, kindly took the members over the works and described the same. A locomotive and specially fitted-up trucks were placed at the disposal of the members by the contractors.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—The twentieth voluntary pass examination of candidates for the offices of Municipal Engineers and Surveyors to District Councils carried out by this Association was held at the Town Hall, Manchester, on Friday and Saturday, the 4th and 5th inst. Thirteen candidates entered themselves for the examination, the written portion of which was taken on the first day. The greater part of the second day was occupied with the *viva voce*

portion of the examination. The examiners were:—(i.) For Engineering as Applied to Municipal Work, T. De Courcy Meade, M.Inst.C.E., Past President. (ii.) For Building Construction, E. Pritchard, M.Inst.C.E., Past President. (iii.) For Sanitary Science, J. Lemon, M.Inst.C.E., Past President. (iv.) For Public Health Law, J. T. Eayrs, M.Inst.C.E., Past President.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday, October 7, 1895, Mr. Wm. George Peirce, President, in the chair, a paper was read by Mr. Reginald E. Middleton, M.Inst.C.E., on "The Relative Value of Percolation Gauges." The object of the author of this paper was to examine into the relative value of percolation gauges situated at Nash Mills, Lea Bridge, and Rothamsted, as regards the records of each, their reliability when compared with other sources of information, and the evidence which is afforded as to the quantity of rain water which may be assumed to pass into the underground reservoirs which supply wells and rivers. It was shown that there are remarkable discrepancies between the records of the gauges themselves, and that the percentage of rainfall which percolates does not appear to be consistent throughout, although the water percolating follows the records of rainfall more closely than is generally supposed to be the case. The author next endeavoured to produce evidence from two other sources, namely, from the varying levels of the water in two wells, and from the gaugings of the rivers Thames and Lea, confirmatory of the general conclusions arrived at from the records of the different percolation gauges. The results obtained have been tabulated, and, although they do not agree between themselves entirely, nor with the records obtained from percolation gauges, they yet afford some evidence generally confirmatory of the results recorded by those gauges, and the differences are probably due rather to a failure in obtaining a proper ratio of discharge in the one case and to a general rather than a particular consideration of the circumstances in the other, than to any inaccuracy in the method adopted. In the case of the rivers, the evidence obtained appears to be of value, especially as indicating that unless the amount of water which percolates into the underground reservoirs has been very largely over-estimated, the rivers do not discharge the whole or anything like the whole of the water collected in the underground reservoirs, but that a very large volume passes away through some other channel, and is available for purposes of water supply. This volume, in the case of the river Lea, amounts to some 75,000,000 gallons, and in the case of the river Thames to the enormous quantity of 697,000,000 gallons daily. To illustrate the discrepancies, it may be sufficient to give one or two instances. Thus, if the years 1860 to 1866 of the records kept at Nash Mills and Lea Bridge be compared with those from 1866 to 1873, it is found that the Nash Mills gauge passed, during the former period, 23 per cent. of the rainfall, and that at Lea Bridge 29 per cent. was passed, while in the second period the Nash Mills gauge passed 19 per cent. and the Lea Bridge gauge 29 per cent. If the two gauges at Lea Bridge and Old Ford, which are placed only about two and-a-half miles from each other, and are under the same management, be compared, it is found that the percentage of rain passed by that at Lea Bridge between the years 1875 and 1890 is 30·4 per cent., while at Old Ford it is only 25·2 per cent., and in many years the difference is far greater. Similar results are arrived at by an examination of the other gauges.

MONKWEARMOUTH CHURCH.

This general view of Monkwearmouth Church as now existing furnishes an additional illustration to Professor Baldwin Brown's second paper on Pre-Conquest architecture, which will be found on pages 250-252 in this issue.

CARPENTERS' COMPANY'S TRADES' TRAINING SCHOOL.—The classes at this school, which include almost all trades connected with building, such as classes for masons, tilers and bricklayers, carpenters and joiners, plasterers, plumbers, painters and decorators, wood-carvers, and wheelwrights, re-opened in the second week in September, with about 130 students. The President of the Institute of Architects, Mr. F. C. Penrose, has consented to visit the schools early in November, and to address the students.

SHEFFIELD SOCIETY OF ARCHITECTS:

PRESIDENT'S ADDRESS.

ON Wednesday evening Mr. Hadfield, the President of the "Sheffield Society of Architects and Surveyors," gave his opening address, in the course of which he addressed the following remarks specially to the younger members present:—

"The word Architect, derived from the Greek, signifies a chief artificer or constructor. In the records of early Christian times, and notably in those of the close of the twelfth to the sixteenth century, the architect is generally styled 'the Master,' 'Magister operum,' or Master Mason. I may instance Anthemius and Isidorus, both architects or engineers employed by the Emperor Justinian during the erection of the great church of St. Sophia, at Constantinople, in the sixth century.

Master Wilars d'Honecort, a facsimile of whose album or sketch-book is exhibited to-night, was another of these men. The original MS., of thirteenth-century date, is preserved in the Bibliothèque Nationale, Paris, nod. S. G. Latin, 1104, where I examined it some years ago. He appears to have been extensively employed in various parts of France, and even Hungary, and informs his readers that he had travelled in many lands, and writes, 'Wilars de Honcort salutes you, and implores all who labour at the different kinds of work contained in this book to pray for his soul, and hold him in remembrance. For in this book may be found good help to the knowledge of the great power of masonry, and of devices of carpentry. It also shows the power of the art of delineation—the outlines being regulated and taught in accordance with geometry.' Master William of Sens, a Frenchman, who was retained by the monks of Canterbury to rebuild the choir of their Cathedral after the disastrous fire in 1174, and his successor, Master William the Englishman, may also be instanced; and in France, during the thirteenth century, Robert de Luzarches, and after him Thomas de Cormont and his son Regnault, were engaged at the Cathedral of Amiens, and Pierre de Montreuil at the Sainte Chapelle and other thirteenth-century churches in Paris. In the Cathedral of Rheims, on an incised slab, is the effigy of Hugues Libergier, with his measuring-rod and compass, and an inscription recording the erection of the church under his direction in the year 1239. These men, all laymen, were practically in much the same position as the modern resident engineer.

France from the days of Charlemagne to our own, has been a great centre of the building art, and most of the old trade customs are yet in force; the architect there being the chief director and thinker in building operations, is closely in touch with the artists and craftsmen engaged; and by his position keeps at arms length the self-styled specialist, who in the United States and this country, is allowed, mainly by the apathy or want of knowledge of some architects, to elbow them out of their legitimate sphere of authority.

Mr. W. H. White, the accomplished Secretary of the Royal Institute of British Architects, who is intimately acquainted with French building customs, pointed out, in a lecture on 'The Architect and his Artists,' which he delivered at one of the earlier meetings of this Society, that 'in Paris and France generally the architect is the sole and supreme master of the work, and his relations with the master-workmen are constant and direct. He makes his contracts, not with one capitalist' (who may be no craftsman), 'but with a dozen or more master-tradesmen, who each work under his direction, and who look to him only for orders to fix materials, and assist each other at the several stages of the work. This fact renders it essential for an architect in France to be a constant visitor on the works, with the superintendence of which he is entrusted.'

'The visit,' he continues, 'of a French architect to a building in course of erection under his orders, is a most characteristic ceremony, and one not confined to the largest works. He is followed throughout by the masters of each trade engaged, by his assistant architect, who probably resides at the works, and by the principal foreman. A French architect does not think any detail of his building too small for attention, and modern French work, unlike a good deal of contemporary English work, bears comparatively few marks of details culled from trade catalogues. It is artistic and thorough all through, from basement to roof-tree.

Vitruvius lays down 'that an architect should be ingenious and apt in the acquisition of knowledge. He should be a good writer, a skilful draughtsman, versed in geometry and optics,

expert at figures, acquainted with history, somewhat of a musician, and not ignorant of the sciences—both of law and physics.' These ideas of Vitruvius clearly point to the exalted and responsible position of the architects of antiquity, and there is no doubt that in the sixteenth, seventeenth, and eighteenth centuries, men such as Brunelleschi, Alberti, Bramante, Peruzzi, Michelangelo, Palladio, and Vignola, in Italy; Le Pautre and others in France; and our own Inigo Jones, Wren, Vanburgh, and the like, lived up to much the same high standard.

The present is an age of marvellously advanced draughtsmanship, and severe competitive examinations in every calling, but while urging the young architect to fit himself by study for passing through such an ordeal as the R.I.B.A. progressive examinations, let me remind him that brilliant draughtsmanship and the passing of examinations are but a means to an end, and will not necessarily make a man into a good architect. I have examined the drawings of some of the above-mentioned masters, and doubt if any of them would have passed muster at a South Kensington Science and Art Examination in Frechand or Building Construction; nevertheless, their authors immortalized themselves for all time by their works in marble, stone, and brick. They were workers and students to the end of their lives, and I hold them up as your pattern. You have well-organized classes for sketching and the measurement of old buildings, for land surveying, for historical study; the first and last named under a leader, whose achievement in measuring and delineating the north transept of Lincoln Cathedral, brought him the well-earned and coveted distinction of the R.I.B.A. silver medal some two years ago. Let me suggest also for your consideration a work that ought to be no longer delayed, *i.e.*, that of carefully drawing and measuring old local buildings, and any architectural detail of interest they may happen to contain, with a view of issuing the drawings in book form to subscribers. This has been successfully done elsewhere. The German societies of architects make it one of their chief duties, and issue complete records of the buildings in their own immediate district. The Sheffield Guild of Arts and Crafts, through its President, Mr. C. Green, have already drawn attention in the press to the lamentable destruction, that has for some time and must necessarily continue to take place in this city, of much that is worthy of record. Let us join hands with them before it is too late. There is now, at the eleventh hour, plenty of material to work on, and in gathering it in you will be garnering rich stores of old decorative and building types, and at the same time cultivate your designing faculties.

I should like to see more use made by young architects of the admirable classes for the study of geometry, strengths and testing of materials, carpentry, and the like, at the Sheffield Technical School, where practical knowledge may be gained from practical men. This kind of training, and the inspection, setting, and study of building work, whether in the builder's workshop or on the actual building, is invaluable."

Correspondence.

To the Editor of THE BUILDER.

THE ADMIRALTY SCREEN.

SIR,—With regard to the suggestion you have made (page 199) that the additional coach entrances were made by Thomas Papworth, may I say that Mr. Geo. Ledwell Taylor, in his autobiography (vol. 1, fol. 166), claims credit for this alteration of the screen at the urgent instance of the Duke of Clarence, and tells of his perplexity in getting the work done without interference from Mr. Croker, the First Secretary of the Board, who sought to put it in the hands of Mr. Skirke.

Mr. Taylor gives a sketch of the façade, showing the third column in each bay removed, and a cast-iron lintel replacing the stone entablature. Mr. Taylor was appointed Surveyor of Buildings in 1824, and the alteration was made in 1827.

E. W. HUDSON.

THE BISHOP'S THRONE AT NORWICH.

SIR,—In the course of inspecting Norwich Cathedral this week I naturally paid attention to the new Bishop's Throne, designed by Mr. Pearson, R.A., and only unveiled by the Prince of Wales a month or two ago. I was astonished to find that the joints of the woodwork have already begun to go in many places, and so prominent are some of the gaps so caused that they are quite visible when sitting in the

stalls some feet away. I do not know who is responsible for this piece of work, but it seems from credible to those concerned. One I have supposed that considerable pains would have been expended on this throne, having regard to the position it occupies in a cathedral church, and there is any explanation for the very unsatisfactory state of the joints, I shall be very glad to hear. I do not know whether the oak of which the throne constructed is English or not.

Lowestoft.

JOHN E. FREEMAN

"A BUILDERS' CLERKS' INSTITUTION"

SIR,—Referring to the correspondence which appeared in your two past issues re a Builders' Clerks' Institution, I quite agree, as a builder, that an institution of this kind should be formed, not only for Birmingham and London, but from Berwick to Penzance, to endeavour to do for this class of educated labour better remuneration and consideration, and to put a stop to incomes persons occupying the situation of builders' clerks a low figure.

Nottingham, October 7, 1895.

R. H.

The Student's Column

METALS USED IN BUILDING.—I.

ALLOYS.—THE IRON GROUP (continued).

IRON AND CARBON.—Iron possesses a great affinity for carbon, and, practically, all carefully-manufactured iron cast, though it may be to a very small extent, is united with iron in various proportions, up to upon 5 per cent., forming different varieties of cast-iron and steel. Fluid iron containing more than that proportion of carbon will, on solidification, have the excess (or a little lower) separated in the form of flakes or scales of carbon more or less crystallised. The principal distinction between cast-iron, steel, and malleable iron is in the proportion of carbon in combination or alloy with the iron. For iron to take up carbon is not essential that the metal shall be in a liquid condition; a bar may be highly heated in proportion of carbon, and may thus be converted into a species of steel, the operation being "cementation."

The greatest proportion of carbon that may be permitted in malleable iron without diminishing its malleability or softness is about 1 per cent., the precise amount resting with the quality of raw iron used. In a certain state of steel may be regarded as iron having from 1 to 1.3 per cent. of carbon alloyed with it. More carbon present, other things being equal, the harder the steel becomes. It should be forgotten, however, that there are great practical difficulties in the way of studying the composition of iron with various substances. Our present information on that head is almost entirely derived from the observation of the effect of varying elements when several are present. All we know is, that in presence of certain proportions of one or more elements, a greater or less additional element produces specific results. At the same time this will, of course, be altered when the subject is studied more from the scientific standpoint. The relation of carbon to manganese in the preparation of iron and steel has already been alluded to.

Iron and Silicon.—The quantity of silicon present in iron before it produces any appreciable effect depends almost entirely on the proportion of carbon present. Ordinary ferrosilicon contains about 10 per cent. silicon and 1.5 to 2.5 per cent. carbon. With about 4 per cent. silicon, cast iron is induced to become graphitic. With cast-iron, it has been shown that a maximum crushing strength may be obtained with about 1 per cent. silicon, maximum tensile strength with 2 per cent. silicon, and maximum transverse strength with about 1.5 per cent.; that is, when the cast iron has only 2 per cent. carbon.

Silicon being fatal to welding, it is, nevertheless, kept out of wrought-iron as much as possible, and there is a general consensus of opinion amongst metallurgists that the purer the iron the better the weld. Improvements in welding electrical means, may, however, lead to a modification of this statement, but in any case the principle remains unaffected.

Iron and Tungsten.—The union of iron and tungsten forms a highly-interesting alloy, some very valuable alloys result; but iron and metal is not materially used in the building industries we do not propose to deal with, subject at any length. The principal va-

tungsten in steel is for the manufacture of cutting tools; the commonest form of ferrotungsten is known in England as "Mushet's special steel." Some very remarkable properties are brought out in the union of these two substances. For instance, when more than 3 per cent. of tungsten is present, instead of becoming hardened by heating and plunging in water, as is ordinary steel, it is in reality softened. Certain proportions yield a metal possessing valuable electrical properties. That ferrotungsten forges with difficulty may be gathered from the circumstance that the melting-point and specific gravity of tungsten are very high, and the alloy is therefore not easily induced to form. Added to steel, tungsten renders that metal very brittle.

Iron and Chromium.—The application of this alloy has not hitherto been very extensive; a small quantity of chromium in steel produces a fine texture, but if used in considerable proportions it leads to brittleness, and its usual companion, hardness. Chromium is very difficult to melt, but it has a strong affinity for iron, and appears to form alloys in all proportions. Mr. A. Vosmaer, who has made a detailed study of the compounds of chromium, remarks* that, unlike ferromanganese, the crystals of which are developed in the breadth as plates, ferrochrome shows long white needles or very small plates, and the higher the carbon the more needles are visible on fracture, and the richer in chromium the smaller the size of the needles. The carbon seems to be altogether in the combined state, which may be due partly to the fact that chromium pig solidifies very rapidly. Perhaps the principal special property of chromium-steel is its determined resistance to sudden impact, in consequence of which it is much employed in the manufacture of projectiles, though it has not succeeded for armour-plates. In view of its extreme hardness and difficulty of tooling it has been suggested to make safes from chromium steel.

Iron and Phosphorus.—The principal use of phosphorus is in the manufacture of phosphoric pig, such as is wanted for the basic Bessemer process. In pig-iron phosphorus causes the carbon to more readily approach the combined state, whilst the melting-point is lowered, and the fluidity increased. The last-mentioned property is taken advantage of in cast-iron in making thin castings, and especially for ornamental purposes. In such things, strength does not count for much, the principal object being to obtain a clear and even casting. If strength is required, more than 1 per cent. of phosphorus is not permissible except for dead loads, such as is applied to columns. It is not a desirable constituent in steel, especially in hard steel.

Iron and Sulphur.—The presence of sulphur in iron may be regarded as an impurity; nevertheless, it is nearly always found in the metal, no matter how carefully the smelting operations have been conducted. Iron ores usually contain some sulphur, but coal used for smelting purposes commonly has more, and it has been aptly remarked, that if it were not for the fortunate circumstance that sulphur can be separated in the blast furnace, the whole process of iron and steel manufacture would be rendered practically impossible. Perhaps the only instance where a sulphide of iron is purposely used is in the manufacture of certain cast-iron guns. Sulphur gives rise to blow-holes in castings, and, on the whole, has a very deteriorating effect on steel. Nevertheless, as previously mentioned, it is almost impossible to get rid of it entirely in iron and steel manufacture on the large scale. But whereas .04 per cent. sulphur would render wrought-iron useless, as much as .1 per cent. may be present in steel without interfering with the rolling property of the metal.

Iron and Nickel.—The merits of this alloy have been carefully investigated by Mr. James Riley, of Glasgow,† from which we learn that the metal sets steadily in the mould; is more fluid than ordinary steel when melted; sets more rapidly, and appears to be thoroughly homogeneous. There is less liquation of the metalloids in ingots made of the alloy; whilst the scrap produced in hammering, rolling, shearing, &c., can be remelted in making another charge, without loss of nickel. In nickel-steel there is present essentially nickel, manganese, and iron, with carbon, silicon, phosphorus, and sulphur. A difference in relative quantity of some of these constituents will greatly influence the character of the alloy. In the communication alluded to by Mr. Riley gives the results of many tests made by him, to which the student is referred. The general result seems to

indicate that the addition of nickel to mild steel considerably increases the elastic limit and breaking stress. With very little carbon, and with 10 per cent. nickel, a very hard alloy was produced. It is stated that steels rich in nickel are practically non-corrodible, and that even those poor in that metal are less corrodible than other steels. Without the assistance of manganese in the alloy the conditions of treatment would be unsuccessful, so that, in reality, we may regard nickel-steel as an iron-nickel-manganese alloy, with carbon, &c. The high price of the alloy is the principal objection to its more extended use, but in special cases this may, to some extent, be counterbalanced by such advantages as increased strength, reduced scallings, and non-corrodible properties.

Iron and Copper.—One per cent. of copper renders cast-iron hard. It has been generally asserted that copper is a highly undesirable constituent in steel, but recent researches have not altogether confirmed that view. It also renders steel hard, and increases its tensile strength.

Iron and Titanium.—The rich iron-ore districts of Gellivara and Kiruna, in Sweden, which now supply enormous quantities of the metal to North-western Europe, always show a small percentage of titanium; it occurs also in many other iron ores. In pigs it forms an ordinary alloy with the iron—as much as from .5 to 1.6 per cent. in certain of those from Ireland. Its active influence in cast-iron, however, seems to be of such little importance, in addition to the circumstance that it is usually present only in such infinitesimal proportions, that it can practically be neglected. Not so, however, with steel. It is stated that titanium steel is harder, stronger, and more ductile than ordinary steel; but its uses up to the present have been very limited.

Iron and Aluminium.—Until aluminium became comparatively cheap, there was no incentive to investigate its effects on iron, as it would have been impossible to have used the alloy in consequence of the high price. Nevertheless, the general behaviour of the two metals was, long before, known to scientists. It follows from the circumstance mentioned, however, that its practical effects on the large scale have only been known during the past few years. The greatest development, as with other aluminium alloys, has taken place in the United States. Aluminium is now being regularly used in that country by many of the largest steel manufacturers.* It is added to steel in proportions of from half-a-pound to several pounds of aluminium to the ton of steel, the purpose of the addition being largely to prevent the retention of the occluded gases in the steel, and thereby to produce solid ingots. It also seems to give extra fluidity to the metal, which allows the making of clearer and sounder steel castings, so that in the steel casting trade in that country it is now almost universally employed. In fact, it is claimed by leading metallurgists who have watched the operation of the manufacture of steel castings, that the largest share of the remarkable development of the past few years in the quality of American steel castings has been due to the use of aluminium. In the manufacture of open-hearth steel, aluminium as used is added in small pieces of from ¼ lb. to ½ lb. weight to the ladle during the tapping operation. The aluminium, as might naturally be supposed from what we have already said concerning it, melts instantaneously, as the temperature of the molten steel is so much above the melting-point of the former metal, and it seems to diffuse with remarkable rapidity throughout the contents of the ladle. The diffusion seems to be complete, and there appears to be no need for special precaution for agitation of the metal for that purpose.

Aluminium added to cast-iron produces an effect similar to that brought about by silicon, i.e., it tends to convert the combined carbon in the iron into the graphitic state, thus causing the iron to be softer, freer from shrinkage, and lessens its tendency to chill. A small percentage of aluminium added to white iron will thus change the character of the metal. Whilst aluminium does not always give any clear advantage when used with good grey iron, its employment with inferior grades of pig-iron in foundry work is very marked and of a highly satisfactory character from the makers' point of view.

A valuable alloy is that formed by the mixture of aluminium with ferro-manganese, which allows the production of a ferro-manganese relatively

very low in combined carbon—a property of considerable use with ferro-manganese employed in the manufacture of low carbon steel.

Iron and other substances.—Alloys of iron with cobalt, arsenic, zinc, antimony, lead, tin, &c., have been made, but are not important enough for our purposes to warrant description.

GENERAL BUILDING NEWS.

NEW CASUAL WARDS, BEVERLEY WORKHOUSE.—These buildings, which are just finished, have been designed in a similar style to the new Infirmary completed last year, and are erected on a site adjoining the Workhouse. The principal elevation faces Union-road, and comprises the porter's lodge (which has the female receiving-room and wards behind), and male wards to the right, between which and the porter's lodge is the entrance archway (over the main road to the Workhouse). The gates are of wrought-iron, of an ornamental character. These casual wards provide accommodation for forty-one vagrants, twenty-nine males and twelve females; they consist of an associated ward, affording sleeping accommodation for twenty males; also nine sleeping-cells, eight of which have stone-breaking cells attached. There are in addition six covered stone-breaking bunks in the yard. On the female side is an associated ward for eight females, and sleeping-cells for four. There are also receiving-rooms, bath-rooms, and drying-rooms for clothes, for both male and female divisions. The administrative department, which consists of the porter's lodge and office, and the female attendant's room, is to the left of the entrance-gates. The cells are approached from a central corridor. The premises are heated throughout with Perkins' high-pressure heating apparatus. At the end of the ward for males is the stone-yard. There is also a disinfecting-room, with apparatus on an approved principle. The weigh-engine is under the archway, the beam extending into the porter's office. The architects were Messrs. Hawe & Foley, and the contractor Mr. J. R. Foley, all of Beverley.

WESLEYAN CHURCH, PAIGNTON, DEVON.—The foundation-stone of a Wesleyan church, about to be erected in Palace-avenue, Paignton, was laid on the 11th inst. The design is Gothic, the main feature in front being a large tracery window. The church will have a nave 67 ft. long by 27 ft. 6 in. wide, with side aisles, making a total width of 51 ft. 6 in. On the east side a small transept will be formed for the organ. The total cost, including the value of the site is estimated at 2,500. The seating accommodation will be for 550 persons. Mr. W. G. Coudrey and Mr. G. S. Bridgman are the architects, and the contractor is Mr. S. Blatchford, of Torquay.

NEW CHURCH, MAESTEG, GLAMORGANSHIRE.—At the present time church-building is very active in the diocese of Llandaff, and on the 7th inst. the foundation-stone of St. Michael and All Angels, Maesteg, was laid. The building, which is of English Gothic style, will comprise a tower about 100 ft. in height, a nave with clearstory, large vestries, and a chancel, the choir portion of which will accommodate 150 chorists. The church will be of local stone, with hard Bridgend external stone dressings, while the internal dressings are to be of green Bridgend stone, as also are the arcades, chancel, and arches. Mr. M'Gaul, Bridgend, is the contractor, and Mr. G. E. Halliday, of Cardiff and Llandaff, the architect.

UNITED PRESBYTERIAN CHURCH, KELVINSIDE, GLASGOW.—The memorial-stone of this church was laid on Saturday, the 5th inst. The leading idea of the design, which is Late Decorated, contrasts broad, massive angle piers alternately, with rich tracery in the windows. The entrances are in the frontage to Queen Margaret Drive, and a lofty gable forms the principal feature of the front. The main doorway occupies the centre of the lower stage, and has a richly-moulded and carved arch and panelled tympanum. On each side are cusped headed windows lighting the vestibule; and of angle-shafts dividing these from the doorway run up into the sill of the main window above. The gable is flanked by massive angle piers, which are carried up in plain masonry to about 40 ft. from the ground, above which the surface has cusped panelling to the cornice, terminating in conical form with crocketed angles and carved finials, the total height being about 60 ft. Between these piers the whole space is filled by a mullioned window of seven main lights recessed under a deeply-moulded arch, which spans the gable from pier to pier. Under the apex of the gable is a moulded niche with canopy, and over this the gable terminates with a foliated cross. The side-entrances and staircases flank the main gable and have each moulded doorways with elliptical arches, and the staircases are lighted by dwarf mullioned windows with traceried heads. The side elevations are treated similarly to the front, and form a series of three bays, each bay divided, by massive angle-piers, the spaces between which are filled by four-light windows of varied design, with traceried heads. The piers are carried up as pinnacles with carved terminals, and the side-walls are finished with an open-work stone parapet between the piers. Internally the church is planned for over 750 sittings, of which about 500 are on the

* "Iron and Steel," 1891, p. 117.
† "Journal of the Iron and Steel Institute," 1889.

* See "Mineral Resources of the United States for 1892," p. 250.

area floor. The limited site necessitates both side and end galleries; but these will be kept narrow, and the roof has been designed as a single span. The main beams are on moulded shafts and carved brackets attached to the side walls, from which the ceiling is carried up in coved form to the wall-head. Above this the roof is of open construction, the wood principals being moulded, and the whole ceilings finished in panelled lining. The western end is divided into three bays by stone piers and arches, in front of which is the pulpit platform, with the organ chamber beyond. Behind the church, in connexion with a hall, are vestry and other accommodation. The estimated cost of the church is about 5,000l. The building is intended to be opened early in next year. The architect is Mr. John B. Wilson, of Glasgow.

RESTORATION OF PARISH CHURCH, DEDHAM, ESSEX.—The Vicar of Dedham writes to the *Daily Graphic*, saying that the parish church is in need of extensive reparation. The roof, the massive timbers which are a support and tie to the walls, are very much decayed, and the windows are all in a bad condition. More than 7,600l. have been expended upon the church in recent years; nave, aisles, and clerestories have all been thoroughly repaired, and the flint-work at the base of the tower has been replaced. The foundations are good, and the architect, Mr. Micklethwaite, believes that if the work now advised is executed, the tower will be safe for many years to come. It is a conspicuous feature in the landscape for miles around, and has frequently figured in Constable's paintings.

NEW CHAPEL, ST. DOMINICK, CORNWALL.—The memorial stone of this chapel was laid on the 1st inst. The *Western Morning News* states that it will be a plain building in the Gothic style, and built of local stone with stucco exterior. At the east end will be a small entrance-porch; and supporting the main wall facing the road on the north side, five buttresses of granite and brick. It is intended to seat about 120 people. There will be direct internal communication with the old chapel close by, which is to be converted into a schoolroom, and thoroughly renovated. Excluding the value of the site the work will cost 400l. Mr. Broad, of Painter's Cross, is the architect; and Messrs. Poad & Bennett, the contractors.

CHURCH EXTENSION, WALSALL.—The foundation-stone of the new aisle, which is being erected on the northern side of the parish church at Walsall Wood, was laid on the 7th inst. It is to accommodate 130 people, and the cost is estimated at 800l. Messrs. Cresswell Brothers, of that place, are the builders, and the architect is Mr. H. E. Lavender, of Walsall.

NEW PUBLIC SCHOOL, GLASGOW.—The new St. James' Public School, Calton, was opened on the 1st inst. It is designed in a bold Classic style, and is flanked on either side by a wing, in which are placed teachers' rooms, lavatories, &c. The entrances for boys and girls are also placed in these wings. The infants' entrance is at the back, entering from the girls' playground. The school is three stories in height, and is intended to accommodate about 1,400 scholars, of whom about 500 are infants, who will be placed on the ground floor. There is also room for instruction in cookery, washing, and laundry work. There is a large drill-hall on the ground floor, round which are situated the various class-rooms. The latter are 14 ft. from floors to ceilings, and lined with wood to a height of about 5 ft. The cost of the site and building was about 28,000l. Messrs. Thomson & Sandilands, of West George-street, were the architects.

SANITARY AND ENGINEERING NEWS.

WATER-SUPPLY, BISHOP'S LYDEARD, SOMERSET.—On Wednesday, the 2nd inst., an Inspector of the Local Government Board held an inquiry at Bishop's Lydeard, relative to an application by the Taunton Rural District Council for sanction to borrow 1,200l. for the purpose of securing a water supply for the parish. The clerk to the District Council said the water supply was intended for 750 people. For some years past the water in the village had been found to be impure. It was proposed to take water from a spring two miles away, and upon this being analysed by the medical officer, was found to be very good. The spring yielded about fourteen gallons a minute, or 20,000 gallons a day. The cost of constructing a small tank at the spring and laying a four-inch main to the village would be about 1,000l. The Inspector promised his report at an early date.

POLLUTION OF THE GARELOCH, DUMBARTON.—At a meeting of the Dumbarton County Council, held on the 7th inst., a report was submitted by the "Sub-Committee on the Pollution of the Gareloch," which disclosed a very unsatisfactory state of affairs. For many years the pollution of the Clyde estuary and of the connected lochs has attracted the attention of the Government and of the Local Authorities, but very little has hitherto been done to remedy the evils that admittedly exist. The inquiry that has just been made refers solely to the pollution of the foreshores of the Gareloch, and to the causes of that pollution. The Report states that while there may be doubt as to evil influence on public health from

mud permanently covered by sea-water, there can be no serious question as to the general bad effect of putrefying organic matter, which above an ordinary high-water mark, or intermittently between high- and low-water mark. Of these two conditions the latter is much the worse. The alternate drenching of dead organic matter by water, and exposure of it to sun and air, are just the influences which most readily produce offensive and unhealthy decomposition. At the same time, it would be practically impossible to obtain any complete or permanent remedy for these conditions under the provisions of the present Public Health Act. In every individual case it might be necessary to prove the existence of a nuisance not merely unsightly or offensive, and not merely dangerous to health, but actually injurious to health. There would be many difficulties as to the authorship or responsibility for the numerous accumulations of refuse on the shores of the loch; while as to such material as ordinary garden refuse thrown out on the higher parts of the foreshore, though it is obviously objectionable, it might not, in many circumstances, be easily proved injurious to health. The present investigations by the sub-committee have had to do not merely with the deposit of solid refuse from houses and gardens, but with more difficult questions as to other local causes of pollution of the foreshores between high- and low-water mark. Here, as the sub-committee believes, there are two principal agencies at work: (1) the drainage from the dwelling-houses on the shores of the loch, and (2) pollution by vessels anchored in or lying on the loch. With reference to house drainage, it was ascertained that much of it finds its way into the loch, particularly from stables; and in regard to pollution by ships, that also was proved to exist in an extensive form. As a remedy or mitigation of the nuisance, the sub-committee made two suggestions, namely: (1) To have the Gareloch declared a stream under the Rivers (Pollution) Act, whereby the Local Authority would not be put to the necessity of proving injury to health from sewage pollution, and the power would then exist to interdict pollution, either by sewage or any other means; and (2) To form one or more scavenging districts by virtue of the Local Government (Scotland) Act, 1894, so that the solid refuse belonging to houses and villages could be satisfactorily dealt with. It was moved and carried unanimously that the Report be laid before the Secretary for Scotland, with a view to having these suggestions carried out.

MANCHESTER SEWAGE SCHEME.—A meeting of the Mersey and Irwell Joint Committee was held on the 7th inst., when the City Surveyor explained the present position of the sewage scheme, in view of the difficulties that have arisen with reference to surrounding local authorities. The City Surveyor said that the amount actually paid up to the 10th ultimo was 556,540l., and the total estimated cost of the existing works was 700,000l. Roughly speaking, there was about 100,000l. worth of work now in course of construction, and it would take at least twelve months to complete it. This estimate was based upon the assumption that no further difficulties would be met with. There were four contracts to complete, and the one last advanced would take about twelve months. At Daybuhme there had been eleven tanks at work for the past twelve months, having a capacity of twelve million gallons, and the quantity of sewage now being dealt with per twenty-four hours was 13,600,000 gallons. The estimated future flow from the entire population would be upwards of 24,000,000 gallons. In addition, a costly and elaborate plant for the chemical treatment of the sewage and for sludge-pressing was in operation. In addition to the chemical precipitation, provision had been made for filtration through land. Thirty acres had been laid out and underdrained, and were reported by the late Resident Engineer as complete in June, 1894; but he found that sundry alterations were necessary, and this took nine or ten months to complete. The main drains did not show sufficient defects at that time to warrant him in having them relaid; but he regretted to say that after the beds were in use for three months and had given most satisfactory results the main carriers had collapsed, and with one exception the whole of the main carriers would now have to be relaid. The contractor had already faced the difficulty, and was proceeding with the work, which would take two months to complete. The Local Government Board had sanctioned the sum of 25,000l. for the construction of the first section of artificial filters on the remaining six acres of land at Daybuhme not at present dealt with. He had been carefully watching the experiments that were being conducted at Barking by the London County Council, and a valuable report had been issued by Mr. Dibdin, Chemist to the London County Council. The question now was whether the sewage of Manchester, which entered the works in a practically free state, could be treated deal as good a result as that at Barking, which reached the works in a putrid condition. This, however, the Chemist was now investigating, and the Committee had, at the Chemist's request, sanctioned the construction of two experimental filters, in order that they might have a practical demonstration of the treatment of the Manchester sewage on the system proposed by the London County Council.

LIGHTHOUSE, RATRAY HEAD, N.B.—The

Northern Lighthouse Commissioners have recently had a large lighthouse erected on the Ron Rock, Ratray Head, which will be in operation on Monday next the 14th inst. The *Scottishman* states that the Ron Rock is covered by the sea, except at low water spring tides. The tower is in two stages; the lower portion is 50 ft. in diameter and 42 ft. in height, constructed of heavy granite blocks outside and Portland cement concrete inside. Above this the tower, 41 ft. in height, is of composition block work, surmounted with a coping of granite, the total height of both towers being 86 ft. On the granite coping is fixed a light-room of cast-iron plates, with a lantern with diagonal astragals of gun-metal. The lower tower has two stories, the under one containing the engines for compressing the air for actuating the receivers and siren. The foghorn is placed on the seaward side of the roof of the lower tower. The upper tower is divided into four stories—the coal-air, water store, the dry store, the third the kitchen, and above it the bedroom. In order to facilitate the landing of materials a temporary timber gangway was constructed between the shore and the rock. It has been severely damaged by the waves during the erection of the tower. During the first season good progress was made, the foundation was excavated and three courses of the granite block built, when a severe gale happened which washed down some of the blocks of the unfinished fourth course, and shortly after the works were resumed. In 1893 a gale swept away some of the inside casing work, which had not had time to harden. During the present season the optical apparatus and machinery for revolving it have been erected; the former was made by M. Lepante, Paris, and the latter by Messrs. Steven & Struthers, Glasgow. The optical apparatus consists of nine panels of refracting prisms, the focal distance of the lenses being 5 ft. 6 in. They have been arranged in a large angle of 80 deg. vertically, this large angle being attained by using Mr. Charles N. Stevenson's bi-convex equiangular prisms above and below the lenses. These prisms render unnecessary the use of flint-glass, which causes great loss of light. The introduction of these prisms, it is stated, results in a saving of from 15 to 20 per cent. of light. The full height of this optical apparatus is 5 ft. 6 in., and the diameter 6 ft. The panels are so arranged as to show a group of three flashes in quick succession every half-minute; the power of the beam of each flash is equal to over 39,200 standard candles obtained by means of paraffin. The engine was Mr. David A. Stevenson, and the contractor was Mr. David Porter, of Aberdeen.

VILLAGES WATER SUPPLY, EVESHAM.—The Evesham Rural District Council has instructed Mr. J. E. Wilcox, C.E., of Birmingham, to obtain tenders for all works in connexion with the scheme for villages water supply, which embraces some thirty-five miles of mains and the construction of four service reservoirs, and also to proceed with the water supply to Aldington and extensions to Hampton. Mr. Wilcox has also been instructed by the Council to submit a scheme for the sewerage of Great and Little Hampton.

FOREIGN AND COLONIAL.

FRANCE.—M. Duvalard, engineer, has brought forward a scheme for bringing the water of Lake Lemans to Paris. According to his scheme it would be possible, without injuring the navigation of the Rhône, to take from the lake two milliard cubic metres of water per day, and to bring it to the capital by a canal which could be constructed in six years. A definitive decree has placed the management of "Établissements Civils" under the Department of Public Instruction and Fine Arts. The museum at the Sévres manufactory has received an addition in the shape of a fine collection of Chinese ceramic work, including 841 pieces, the value of which is estimated at nearly 300,000 francs.—The marriage of Fernel, an eminent physician in the time of Henri II., is to be placed in the principal courtyard of the Ecole de Médecine.—The new Mairie at Issy-la-Moulineaux is to be inaugurated on Sunday. M. Louis Bonnier is the architect. The building erected on the site of the former Couvent at Oiseaux, many portions of which have been preserved, and which has become the Salles des Fêtes de la Commune.—At Neuilly-sur-Seine, a few days ago, a large group of school children, designed by M. Albert Triau, were opened.—M. Etienne Leroux, the sculptor, has been commissioned by the Municipality of Compiegne to execute a monument of the defence of that town against the Allies in 1874. The monument will consist of a granite stèle decorated with palms, flag, the arms of the town, and inscriptions. On the stèle will be the bust of the commander who directed the defence.—M. Antonin Mercier is working on the completion of the monument which the town of Lille is about to erect in honour of the National Defence in the North. The pedestal will be adorned with three standing figures representing "France," "Lille," and "History." The latter engraving on a shield the record of the battles of Fontenoy, Valmy, and Noireau, which are represented on two side bas-reliefs. At the summit, on a pile of cannons and wounded soldiers, is the equestrian

due of General Faidherbe. The monument will probably be inaugurated in May next.—There is talk of erecting a certain number of statues at various places in Brittany: at Dinan, that of Guesclin; at St. Briev, those of Maréchal de Sébastien; at Admiral Charner; at Plénest, that of General de la Motte Rouge; and at Lamballe, bust of Dr. Robert de Lamballe.—An important collection of paintings has been added to the art gallery in the fine art collection at Lisle.—Louvans, on Sept. 30, a monument commemorative of the 1870-1 war was inaugurated. It is designed by M. omasset, architect, and includes a female figure representing a palm, which has been executed by M. utthier.—M. Sirodot, architect, of Dijon, has been commissioned to execute the pedestal of a monument which is to be erected shortly at Boncourt-Pois, in commemoration of the battle of Nuits in 1703.—The first length of the new railway line in Lyons to Paray-le-Monial, by the way of Chagny, has just been opened.—A landscaper, M. Verdier, has just committed suicide, at age of forty-six. He was a pupil of Gleyre, and obtained an honorable mention in the Salon of 1870.—The death is announced, at the age of 70, the sculptor Hyacinthe Chevalier, who enjoyed a reputation under the Second Empire. He was a pupil of Toussaint, and had executed a certain number of statues to decorate the walls of Parisian dwellings, among others the statue of Eugène Sue for the new Hôtel de Ville.

AUSTRIA.—The Royal Commission of Fine Arts Vienna has two new members for the coming year, these being Wagner, architect of the Imperial Royal Academy, and the Curator of the Imperial and Arts Museum, Herr Ribarz.—The Emperor of Austria has conferred the much desired distinction of the Iron Cross on Herr Berger, the Vienna City Architect. Herr Berger has been in the service of the Municipality since 1833, and held his present position since 1883. He has also been a member of the Imperial Board of Works, and received a minor distinction.—Vienna is to have an extensive abattoir for pigs. A special commission of experts has been instructed to visit similar institutions in other capitals, previous to deciding on the scheme to be adopted.—The site of the "Cottage Verein" at Vienna, which is actually being laid out on English principles with lawns and bungalows, has increased in popularity, and includes an extensive area in the Doebbling and Schönbühel suburbs. The experiment of introducing small English detached houses has been successful, but it has not as yet had any appreciable effect on the increase of the huge barracks with small apartments and flats.—The Carl Theatre at Vienna has been reopened after undergoing extensive alterations.—The new National Theatre is being completed at Agram. The Emperor of Austria will attend the opening ceremony on the 1st inst. Messrs. Fellner & Helmer are the architects.—A new hospital has been opened at Poelten this week by the Emperor of Austria. It is to be a memorial to the Emperor on the occasion of his jubilee. It has two hundred beds, and the plans, which were prepared by a Viennese architect, Herr Schnal, of Vienna, are considered exceedingly practical.—The Danube Canal, which is through Vienna, has been closed in connection with the extensive improvements lately in hand.—A new bridge over the Danube at Vienna has been completed, and is to be named after the late Emperor, Franz Joseph I. The monument to the play-actor, Laube, has been unveiled at Spittelau, and is in bronze, and comes from Berlin. Professor Püschel is the sculptor.

RUSSIA.—Of the several elaborate schemes which the Czar proposes carrying out—we have lately read in the new Museum and the proposed Opera House—the intention to erect a large military club at St. Petersburg is most popular in official circles. The club-house will be open to all officers of the army and navy stationed at the capital, or passing through the city, and, besides the usual accommodations, will have a hotel wing with bedrooms. There will also be a large lending library and a co-operative stores in connection with the institution. The cost of the building is estimated at 300,000 roubles, and will be defrayed from the Czar's purse. The site is at the corner of the "Petersburg" and "Leningrad" streets. Professor Alexander Ostrovnich and Leningrad.—Professor Alexander Ostrovnich, a prominent member of the Russian Academy, has died at the age of sixty-five. Professor Ostrovnich held many commissions for the Imperial Household and the Russian Government. Amongst his most successful works may be named the "Petersburg" monument at Warsaw, and some of the "Petersburg" monuments.

VITZLAND.—The annual general meeting of the Swiss Architectural Society has been held at Vitzland. Professor Auer read a paper on his new designs of Parliament, which have been illustrated in the "Builder".—The new William Tell monument at Aarau has been unveiled. The sculptor is Kistling.—The proposed bridge at Bern, designed by which has been the subject of a petition, is now being carried out. The central span of the bridge will measure about 350 feet, and will be the constant increase of tourist traffic at the new central railway station has been commenced.

MISCELLANEOUS.

GRANITE EXPORTS FROM ABERDEEN TO THE UNITED STATES.—During the year ended September 30, 1895, the value of the manufactured granite exports to the United States, as declared to the consular agent at Aberdeen, was 291,732'42 dol. as against 305,904'70 dol. for the previous year. More than the whole of the decrease is accounted for by the fall in the last quarter of 1894, when trade was very dull. A protracted snowstorm checked work in the first quarter of 1895, which, however, showed a slight rise over the first quarter of 1894. For the second quarters of 1895 and 1894 the figures were respectively 87,225'14 dol. and 77,362 dol.; and for the third quarters 80,034'18 dol. and 74,076'98 dol., and this improvement promises to continue. The exports include a considerable number of fine polished columns, principally for buildings in New York, in Peterhead (red) granite. Most of the larger monuments are also in Peterhead granite, and there has been a greater demand for Hill o' Fare (dark red) granite than the quarries there could supply. The American fancy in red granites has accordingly run a good deal on several varieties of Scandinavian stone. This taste is expected to change sooner or later. Certain grey varieties from Scandinavia and Russia have also been introduced, as well as a good few Scandinavian "labradorites." Altogether, about fifty varieties of granites are now used in the monumental works in Aberdeen—about one-half being British and Irish and the other half Continental. American granite has very rarely figured in these works; but Messrs. J. Whitehead & Sons have in hand an elaborately-carved monumental cross in Western (Rhode Island) granite (grey), and Messrs. A. Macdonald & Co., Limited, have imported a parcel of real labradorite.

CATHEDRAL SURVEYORSHIP.—We are informed that the Dean and Chapter of Winchester have appointed Mr. J. B. Colson to the post of Architectural Surveyor of the cathedral and other buildings belonging to the Chapter. Mr. Colson has for some years past discharged the duties of the office as deputy for his father, the late Mr. John Colson.

PARTNERSHIP.—Mr. Edmund Law, architect, and County Surveyor, Northampton, has taken into partnership his head assistant, Mr. Sidney F. Harris. The practice will now be carried on in the name of "Law & Harris, Architects and Surveyors," Northampton.

DEMOLITION OF THE "QUEEN'S HEAD" INN, SOUTHAMPTON.—We learn that it has been decided to pull down this famous old hostelry. At one time a mansion, it belonged to the family of Poyntings, of whom was sword-bearer to Jack Cade. Henry VIII. turned it into a storehouse for the armoury and harness made by his armourers in Southampton, and it subsequently was used as a hostelry for coaching purposes.

DISTRIBUTION OF PRIZES, KING'S COLLEGE, LONDON.—On the occasion of the distribution of prizes at King's College, on the 4th inst., by the Master of the Carpenters' Company, Professor Banister Fletcher gave an interesting account of the building construction lectures and classes, of the architectural studio in the college, and of the wood-carving classes. He reported continued progress, and believed that the exhibition of some of the drawings shown that night would convince those present that the work done by the students was of a very thorough character. The total number of students in those classes was 75, an increase of 33 over the preceding year; 42 attended his lectures, 120 constructional drawing, 39 quantities, and 12 the architectural studio, some students, therefore, attending more than one class or series of lectures. The attendances at the wood-carving classes were—day classes, 20; evening classes, 21, which alone gave marked improvement. Professor Fletcher mentioned that the number of drawings prepared in the constructional-drawing classes was 273. The prizes, medals, and scholarships about to be distributed would indicate some considerable exertion amongst the students, as also would the exhibition of the students' work in wood-carving. The whole of this was enabled to be accomplished by the generosity of the Carpenters' Company, which annually endowed the classes and gave prizes. The remainder of the expenses on the wood-carving classes, not covered by that endowment, was generously found by the late Master, Mr. Henry Harben; no portion of the expenditure fell upon the students. There was in that college a splendid few technical museum and library for the youths to avail themselves of.

THE LATE MR. HENRY SMITH.—A correspondent asks us to add to the list of important works in connection with which Mr. Smith was engaged, the South Middlesex Asylum ("Claybury Asylum"), at Woodford, for the London County Council, the total cost of which amounted to about £25,000.

REGISTERED TELEGRAPHIC ADDRESSES.—We have received the No. 3 Supplement of Sell's "Directory of Registered Telegraphic Addresses" for the year, which corrects the information supplied by the Post Office during the last three months. All further corrections, with those already made, will be incorporated in the volume for 1896.

JOINERS' STRIKE, SWANSEA.—The Western Mail says that the Swansea master builders on Monday, the 7th inst., met a deputation of the carpenters and

joiners who have been on strike for fourteen weeks for an advance of a halfpenny per hour and a rearrangement of the working hours. After a protracted sitting the men agreed to resume work at the old rate of wages, 8d. per hour for a week of fifty-four hours.

LEGAL.

ALLEGED INTERFERENCE WITH ACCESS OF LIGHT.

THE case of Hawkins v. The Oxford (Limited), came before Mr. Justice Hawkins sitting as Vacation Judge in the Chancery Division, on Tuesday last, the 8th inst., it being a motion made *ex parte* to restrain the defendants till next motion day from proceeding with the erection of a building at the rear of the Oxford Music Hall in Oxford-street, &c., so as to interfere with the access of light to the premises belonging to the plaintiff. The learned counsel who appeared in support of the application, said that on the 8th inst. the defendants wrote that it was not intended at present to go on with the work, though they did not admit the right claimed by the plaintiff. However, on Saturday at one o'clock the defendants proceeded with the building, and the work went on all day on Sunday.

His Lordship granted an interim injunction extending over Tuesday next, with leave to serve a notice of motion for that day, the plaintiff entering into the usual undertaking to be answerable in damages.

MEETINGS.

FRIDAY, OCTOBER 11.

Architectural Association.—First ordinary meeting; President's opening address, 7.30 p.m.

SATURDAY, OCTOBER 12.

Glasgow Architectural Association.—Opening of new rooms, 127, Pitt-street. 3 to 5 p.m.

MONDAY, OCTOBER 14.

Clerks of Works' Association.—Paper by Mr. R. Wheeler. Carpenters' Hall. 7.30 p.m.

TUESDAY, OCTOBER 15.

Glasgow Architectural Association.—Lecture by Mr. Malcolm Stark, Hon. President. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Newsholme on "The Nature of Nuisances." 8 p.m.

WEDNESDAY, OCTOBER 16.

Sanitary Institute (Lectures for Sanitary Officers).—Inspection of disinfecting station, St. Pancras. 3 p.m. (Number limited.)

Builders' Foremen and Clerks of Works Institution.—Quarterly meeting of members. 8 p.m.

THURSDAY, OCTOBER 17.

Institution of Junior Engineers.—Visit to Messrs. Caird & Rayner's works, Commercial-road. 6.30 p.m.

FRIDAY, OCTOBER 18.

Sanitary Institute (Lectures for Sanitary Officers).—Professor Hoscock on "Trade Nuisances." 8 p.m.

SATURDAY, OCTOBER 19.

Sanitary Institute (Lectures for Sanitary Officers).—Inspection of Harrison & Barber's Knacker Yard. 3 p.m.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

20,735.—KILNS: *J. Stein*.—Relates to kilns for firing bricks, pottery, and the like, and deals with methods for utilising the heated gases from the kiln in which they are generated, for drying the articles in one or more other kilns. For this purpose a number of kilns are arranged in connexion with each other, and communicate from one to another by flues or passages underneath, leading from a series of holes in the floor of each kiln. There is also a main underground flue, in connexion with the under-flues of the several kilns, and an overhead flue; both of these communicate with a chimney. Dampers are provided for controlling the action of the combined system.

20,736.—ROOFING-TILES: *G. Schultze*.—Deals with improved roofing-tiles and apparatus for manufacturing same. A tile is made with a conical-shaped projecting nose at its bottom side, and grips beneath two adjacent tiles. Recesses are also formed on all the meeting faces of the tiles. A machine for producing the above is also described and claimed.

20,869.—FIREPROOF DOORS: *C. Brumman*.—Consists of a door formed of a layer of boards, arranged on each side of a frame, with the grain running in different directions, and also covered with tinned metal sheets. Between the said layers of boards a core of slag wool or other non-combustible material is interposed.

25,021.—HOT-WATER APPARATUS: *S. Naylor*.—A kitchen-boller or other water heater for domestic purposes consists of a rectangular cast-iron block having a water space or passage cored out of its interior and placed at the back of the fireplace.

25,024.—WALLS: *K. Siebold*.—Deals with facings for walls and other structures wherein the facings are connected by grooves and tongues, either with the backing, or with each other, or both.

25,658.—WATER-CLOSETS: *J. Barrett*.—Pertains to improvements in water-closet fittings to facilitate the adjustment of, and access to, different parts. The seat is made removable and provided with an improved hinge connexion, whilst simple and effective means for connecting the water-supply pipe with the bowl, and several other novel alterations, are enumerated.

NEW APPLICATIONS FOR LETTERS PATENT.

SEPTEMBER 23.—17,675, E. Becker, Scaffold Bracket.—17,678, B. Rhodes, Water Storage Cistern.—17,680, S. Chantrell, Water-closet.—17,711, C. Hofmann, Stoves.—17,755, H. Woodford, Plane Irons and other Edge Tools.

SEPTEMBER 24.—17,776, T. A. Houghton, Windows and Sliding Sashes.—17,787, F. Keep, Gates.—17,871,

SOUTHERN.—For the erection of a home for cripples, for the Council of the Ragged School Union. Mr. G. E. Holman, architect, 6, King's Bench Walk, Inner Temple. Quantities by Mr. A. K. Ball, 118, Holborn.—
 E. Lawrence & Son £3,878
 McCormick 3,499
 Baker & Wiseman 3,468
 T. H. Craig 3,438

STOWMARKET (Suffolk).—For the erection of a house and shop, Market-place, for the Stowmarket Charity Trustees. Mr. H. C. Bishop, architect, Stowmarket.—
 Kenney £2,857
 Andrews & Murray, West 2,263
 Stowmarket (accepted) £4,913

THAKEHAM (Sussex).—For the supply of road-metal, for the Rural District Council.—

	Cubic Yards.	Price per cubic yd.
Wm. Hudson, Brighton	80	7 9
R. Lillywhite, Cootham, Pulborough	20	8 0
Wm. Goscher, Pulborough	100	8 0
	150	8 0
	240	8 0

WALTHAMSTOW.—For the erection of a board-room at Cleve and for the School Board. Mr. W. A. Longmore, architect.—
 Holand £1,072
 J. A. Reid 945
 Fuller & Son 865
 W. Lawrence 773
 R. & L. Evans £733
 Morrison & Godwin 731
 Holland & Hooker 695
 Accepted. † Too late.

WATFORD (Herts.).—For the supply of 600 tons of broken granite, &c., for the Urban District Council.—
 W. A. Judkins, Nuneston, 9s. 11d. per ton.

WIMBLEDON.—For making up roads, for the District Council.—
 1 mile 10 fms. South Cowper road, Pe. rd. road.
 E. Hes £256
 S. Hudson £254
 A. S. Cadey 718
 T. Adams 515
 [Surveyor's estimates 660
 Wychie £1,611
 South Cowper £241
 Pe. rd. road 728
 2 miles 2,427
 2 miles 1,880
 500

WINGATE (Durham).—For the construction of reservoir, &c., for the Directors of the Wingate and District Water Company, Limited.—
 J. Howe & Co. £4,197 10
 J. Davidson 3,533 10
 H. Curry & Son 3,750 10
 J. Thompson 3,556 0
 H. S. Sudren 3,422 5
 C. B. Williamson & Co. £3,244 19 0
 T. Bell 2,959 19 0
 J. G. Rutter & Son 2,904 19 4

WOKING.—Accepted for making a new road on the Hill View Estate. Mr. R. Clapp, surveyor.—
 James Whitburn, Woking Village £465

WOKING.—For the erection of a cottage, Oakfield-road, for Mr. W. Dredge. Mr. R. Clapp, architect.—
 G. Allard £279
 W. Gale 293
 W. R. Roake, Horsell Moor (accepted) £265

WOKING (Surrey).—For the construction of roads, with surface drains, West Hill Park Estate, for the National Land Corporation, Limited. Messrs. Pooley & Follett, surveyors, 21, John-street, Adelphi, W.C.—

S. Claflin £9,277 0
 W. Griffiths 2,121 0
 W. Cunliffe 1,811 0
 W. Nicholls 1,710 0
 T. Adams £1,695 0 0
 S. Kavanagh 1,644 7 6
 J. A. Franks 1,596 0 0
 J. Williams 1,543 11 4

WOODBIDGE (Suffolk).—For the erection of banking premises, The Thoroughfare, for Messrs. Bacon, Cobbold, Tolemache & Co. Mr. T. W. Ginn, architect, Northgate-street, Ipswich.—
 W. J. Smith £3,364 0
 J. Fordlike 3,255 12 6
 G. Barrell 3,298 0
 F. Bennett 3,199 0
 F. Dupont £3,195 0 0
 F. Parkinson & Son 3,050 0 0
 E. Adams 2,665 9 0

WREXHAM.—For the erection of C.M. Church and schoolroom at Brymer. Mr. J. E. Lash, architect, 5, Temple-row, Wrexham.—
 S. Moss £2,003
 A. Hulse 1,945
 T. Williams 1,940
 Wrexham £2,935
 Accepted.

TO CORRESPONDENTS.

W. L. (amounts should have been given).
 NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.
 We cannot undertake to return rejected communications.
 Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.
 All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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PUBLISHER'S NOTICES.

Registered Telegraphic Address, "THE BUILDER," LONDON.
THE INDEX, with TITLE-PAGE, for Volume LXVIII. (Jan. to June, 1899) was given as a supplement with the number for July 19.

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 Six lines (about fifty words) or under 4s. 6d.
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 Advertisements for the current week's issue are received, up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-FAST ONE p.m. on that day. Those intended for the front Page should be late TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.
 The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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OCTOBER 19, 1905

ILLUSTRATIONS.

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Wolfgang's Kirche, Rothenburg.—Drawn by Mr. R. Phéne Spiers, F.R.I.B.A. *Double-Page Ink-Photo.*
Hotel Cecil, Victoria Embankment.—Messrs. Perry & Reed, Architects *Two Double-Page Photo-Lithos.*

Blocks in Text.

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A New Water Supply for London.



THE decision of the London County Council, on Tuesday last, not to proceed with the eight Water (Transfer) Bills, is a complete reversal of the policy of that body in regard to the water supply question. The Council no longer regards itself as a heaven-born authority sent to take charge of the water supply of the metropolis in the event of the present companies being superseded. It has now been resolved, though only by a majority of one, to "invite Her Majesty's Government either to deal with the question themselves or to appoint a Royal Commission to do so." In other words, before moving any further in the matter the Council wants to be quite certain whether, if the control of the water supply is to be vested in a central authority, the London County Council is to be that authority or not. It will then know how to act accordingly. We think the Council is well advised to take this step—indeed, it would have been better for it to have done so long ago. By assuming too much authority it tended to alienate sympathy from the general question as to the desirability of placing the water-supply under public control. Now that the Council is willing to have the question discussed, it may get what it wants, or at any rate the way is paved to a better understanding between conflicting parties as to the centralisation of the water control.

But it is probably a mistake to imagine that because the Council has given way thus far, it intends to abandon the water-supply question, or to altogether yield up its claims to be the proper authority to control the supply. The only difference is that whereas it formerly objected, it is now willing to have those claims discussed—at least, that is how we understand the present action. In the event of a Royal Commission being appointed, there is no doubt that the Council would see every endeavour to enforce those claims. It is not a little remarkable that, at this juncture, the London County Council should have brought out a new scheme of water-

supply for the metropolis,* and which is, on the whole, the most practicable scheme put forward in recent years. Yet, if we take these two circumstances together—the abandonment of the Water Transfer Bills and the publication of a new and practicable scheme, almost simultaneously—we seem to discern the future policy of the Council. The Council has satisfied itself, at length, that abundant water for London may be obtained from the Welsh hills; where is the necessity, therefore, for transferring in their entirety the undertakings of the water companies to the Council, assuming that body to be the future water authority? Such a procedure would be waste of money. What it wants is a mandate to proceed with the Welsh scheme, though it does not say so in so many words; but before obtaining that, the Council has wisely resolved to see how far the powers that be will permit it to assume the necessary authority to carry out the work. That is why the Royal Commission is wanted. Who would be better equipped for discussing the question before such a Commission than a public body with a feasible water-supply scheme in its pocket? It is absurd to imagine that the Commission would be seriously occupied in finding out whether or no a public water authority is wanted: the public has already made up its mind upon that point. The main question is, Who shall be that authority, the County Council or some other body? That is what the Royal Commission would have to decide.

In the meantime it will be well to consider the Council's new water scheme as designed by its Engineer, Mr. A. R. Binnie, assisted by Mr. Hassard, Mr. G. F. Deacon, and the staff of the Water Department. As previously remarked, this appears to be a perfectly feasible scheme, and it is to some extent based on the experience gained by Liverpool in capturing Welsh water. At the same time sundry points about it are not as clearly stated as could be wished, and certain observations made by the Engineer do not seem to be borne out by the facts. Briefly, Mr. Binnie proposes to utilise the head waters of the Rivers Usk, Wye, and Towy in the counties of Cardigan, Brecon, Radnor, and Montgomery, by impounding them in enormous reservoirs at convenient spots, and ultimately sending them by aqueduct to London. These sources of supply

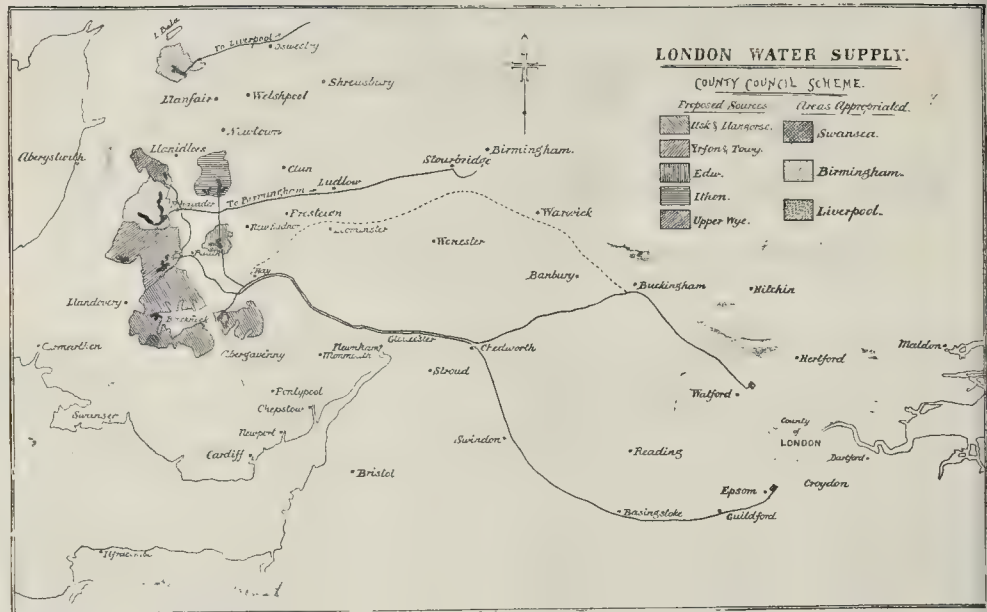
* "Report on Available Sources of Water Supply for London." By A. R. Binnie.

are situated at altitudes above 600 ft., extending to 2,800 ft. above the sea-level—sufficiently high to enable the water to be delivered by gravitation to service-reservoirs on hills in the neighbourhood of the metropolis, from which it could be distributed, also by gravitation, to consumers. The summits of Hampstead, Highgate, Shooter's-hill, and the Sydenham-hills would, however, have to be supplied by pumping. The existing distribution pipes are to be utilised. The scheme is so arranged that the work may be constructed in sections as required, and it is proposed to bring the water ultimately by means of two aqueducts, one to discharge into a service reservoir at Boreham Wood, not far from Watford, to supply the area north of the Thames, and the other to end in a similar reservoir at Banstead, not far from Epsom, to furnish the area south of the river. As will be seen on reference to the map, these aqueducts keep each other company from Wales through Gloucester to the neighbourhood of Chedworth, where they bifurcate, one going north-eastwards to near Buckingham and then turning south-eastwards until it arrives at its destination, the other proceeding in a southerly direction towards Basingstoke, and so on to Epsom. As an alternative, for reasons presently to be explained, an aqueduct (shown on the map) is tentatively proposed to run north of the two main aqueducts just alluded to, commencing from Hay, running up to the vicinity of Stourbridge, then down to the neighbourhood of Buckingham, and on to Boreham Wood.

To consider the scheme more in detail, we may commence with the divers catchment basins suggested. These are:—

1. Portions of the upper part of the Usk Valley (including Llangorse), with an area of 136,000 acres, or 212½ square miles.
2. The Yrfon, a tributary of the Wye, combined with the upper sources of the River Towy, having an area of 102,600 acres, or 160½ square miles.
3. The Edw, also a tributary of the Wye, with 17,000 acres, or 26½ square miles.
4. The River Ithon, which ultimately flows into the Wye, with an area of 34,800 acres, or 54½ square miles.
5. The upper portions of the River Wye itself on the flanks of Plynlimon, with 22,000 acres, or 34¼ square miles.

Regarding the location of these different sites as indicated on the map, it will be



observed that an area already appropriated by Birmingham is sandwiched in between the Yrfon and Towy district on the south and the Upper Wye sources on the north. The proposed aqueduct running from the former to the latter district crosses the main aqueduct to Birmingham at Rhayader. It remains to be seen whether Birmingham is going to quietly submit to this prospective invasion of territory that might legitimately be regarded as within her "sphere of influence." It may be argued that the capital of the Midlands has already secured sufficient gathering-ground for her purposes, seeing that she has a slice of territory 45,000 acres in extent, which is said to be capable of yielding as much as 100 million gallons per day. Of this, Birmingham will only require about 27 million gallons daily, but a similar volume is to be discharged by way of compensation for the Wye. This takes into consideration, however, the circumstance that the existing supply to the city—17 million gallons per day—is to be kept on. If it should turn out that the water from the Welsh hills were preferred to the existing sources of supply, the latter would have to be abandoned, so that, on compensation and potable water being withdrawn, a balance of only 30 million gallons remains available in the watershed. But that is not all; the Birmingham Corporation is by its Water Act compelled to supply any towns situated within fifteen miles on either side of the line of aqueduct, if those towns desire to be so supplied. Such towns as Wolverhampton, Walsall, Bridgnorth, Dudley, Tipton, Wednesbury, Kidderminster, Redditch, Leominster, and many other populous places fall within the fifteen-mile limit, and there is the possible contingency of Birmingham being required to supply them, or some of them. With only 30 million gallons to spare, it will readily be perceived that the Corporation would be extremely unwise to permit London to occupy all the proposed ground without a struggle. We merely throw this suggestion out as a sample of the opposition likely to be incurred. It will be remembered that the London County Council were bitter opponents to the Birmingham Corporation Water Bill at the time it was passing through the House. That circumstance will not tend to ameliorate matters. In regard to Liverpool, all the proposed catchment-areas are too far away from

her gathering-ground for that city to be able to make any very effective resistance, even if she were so minded.

Now, as to the quantity of water these areas are likely to yield London, Mr. Binnie estimates as follows:—

1. Usk and Llangorse area	= 182 million gal. per day.
2. Yrfon and Towy	" = 135 "
3. Edw.	" = 18 "
4. Ithon	" = 37 "
5. Upper Wye	" = 43 "

Total..... 415

The Engineer is at much pains to convey an idea of what this enormous quantity of water means, and he compares it with the flow of the Thames, which might at first sight lead one to suppose that the watersheds alluded to will yield a greater volume of water than does the Thames. When we go into the matter, however, we find that special years and special months (not the wettest) are selected for illustration. There was no occasion to do this, and it would have been magnanimous on Mr. Binnie's part to have left the Thames alone.

The Engineer sees no objection to our still keeping on the supply from wells both in the Lea Valley and from the sources of the Kent Water Company, which supply is estimated at 67 million gallons daily. He adds this amount to the 415 million gallons available from Wales, and makes a total of 482 million gallons a day, which at the rate of 35 gallons per head per day would suffice for a population of nearly 13,800,000 persons—the probable population of the districts now supplied by the various water companies in the year 1945. In other words the scheme is based on a fifty years' outlook. We are told that portions of the scheme may be carried out as desired, which, in view of the facts last stated, seems rather facetious. In the first place, at least five years would be absorbed in Parliamentary and litigation work, to say nothing of the time it will take the proposed Royal Commission to hear evidence and "report," and for the afterwards properly constituted water authority to make up its mind to put the machinery in motion. At least another five years must elapse ere the first section of the work is completed ready to deliver the water. By that time, according to estimated population and its requirements at the end of the ten years, it would be necessary

to commence with section No. 2 of the works and so on. To borrow a phrase, fifty years "is a short period in the life of a great city" and when we see the areas hedged in, we may well ask whether the Engineer is contemplating a sufficiently large catchment area. Swansea has booked and secured some of the Usk valley (see map); while we are proceeding with the outline of the scheme would it not have been advisable to have proposed a larger area than that taken as a basis by Mr. Binnie? It is now too late; never; all large corporations in the Midlands not blessed with a good water supply, are looking towards Wales. The seizure must be effected at once, or it will be too late.

Another thing that strikes us is as to the grounds upon which the Engineer bases his figures as to yield of the several areas selected. We do not want to throw in the teeth of the County Council the fact that estimates as to quantity of water available from a given area have generally been below the mark, but we have a right to ask for further particulars on this head in view of the scanty facts given in the report. Particulars of any value respecting the rainfall are given, nor do we gather the precise amount of compensation-water to be allowed though capacities of reservoirs are set out in detail. The Engineer has evidently presumed a little too much on precedent, and it is altogether correct to infer (speaking of the geological character of the ground) that the old red sandstone is as impervious as the majority of the Silurian beds. We find quite clear that percolation must be great, say, in the large area proposed to be taken in the Usk valley, which is almost exclusively composed of old red sandstone than in parts of the Yrfon valley, where the Bala rocks (erroneously said to be Silurian age in the Report) crop out. It must be that the Engineer has taken these things into consideration, but that does not appear on the face of the Report, although it is the most vital part of the scheme. As the idea becomes further developed, the County Council would do well to publish a map showing the geology, both of the sources and drift deposits, and the areas used for grazing or under cultivation; also to append the sketch-map now given.

In regard to the quality of the water, a little objection can be taken to that, and the Report of the Chemist appended to the

...nie does not reveal anything that might have been anticipated. Londoners have been used to hard water and have some difficulty in bringing themselves to use the slightly yellow water to the presence of extremely minute pieces of peat) soft water yielded by the Welsh hills, but it is wholesome enough. It is pointed out, a considerable saving is effected in various manufactures and in the household by the use of soft water. At the present time quite a large sum of money is expended annually in the Metropolis in obtaining the hard water now delivered to the water companies; and there would be saving on this head. But we wonder what the unfortunate people who will be situated within the limits of the chalk well-water of the Lea Valley and in Kent (which Mr. ...nie proposes to retain) will say. There will be an exodus of all laundries, and many other industries, that is certain, from those places to others where the water need not be softened. This affords ground for a further extension of the "betterment" scheme.

In reference to cost of the scheme, the Engineer furnishes the following as a total gross supply of 415 million gallons daily, to provide for all contingencies for a period of from fifty to sixty years hence:—

... works at Llangorse, Yrfor, ...	
... and Wye, with their collecting and communicating conduits and compensation reservoirs.....	£8,135,000
... duct Llangorse to Elstree.....	7,160,000
... duct Yrfor reservoir to Banstead.....	8,070,000
... minal works at Elstree, filters, and connexion with existing distribution pipes.....	4,850,000
... minal works at Banstead, filters, and connexion with existing distribution pipes.....	5,500,000
.....	33,715,000
Contingencies to per cent.	3,371,500
.....	37,086,500
Professional and Parliamentary...	1,685,750
Total.....	£38,772,250

... previously mentioned, however, it is proposed to do all this work at once, the Engineer is in favour, as a first instalment, of utilising the Usk supply of 182 million gallons daily, taking the water from Llangorse Reservoir along one aqueduct Boreham Wood, near Elstree. This is estimated to cost 17,500,000*l.*, including minal works. The aqueduct, amongst other things, would have to cross the Severn means of a syphon-pipe 133 miles in length, and tunnel through the hard Jurassic rocks of the Cotswold Hills; that is, proving the more northerly route were not adopted. The latter route has been suggested, amongst other things, for greater security against the invasion of a foreign foe, when it would be advisable to have the conduit as far away from the English Channel as possible; the two main aqueducts which bifurcate near Chedworth would be better than one, for the same reason, though they have been designed particularly to serve the Metropolis north and south of the Thames respectively. There are not of those, however, who apprehend much danger on that score from foreign foes; though a danger might arise from disturbances nearer at home. The minal reservoirs would, of course, be constructed to hold several days' supply to meet such contingencies.

So much of the scheme is, necessarily, of tentative character, that we hesitate to utilise the estimates of cost. It may be remarked, however, that the actual cost of fitting the supply would much exceed the figures given. For instance, the Lea Valley and those of the Kent Company must be bought; and as existing distribution-pipes are to be utilised, something should be allowed for them, even no compensation were given to the companies for their "vested interests." Birmingham has had to spend a great deal of money in purchases in Wales before she could satisfactorily proceed; London would, no doubt, have to do likewise, though there does not

seem much provision for this in the estimates. At Llangorse a considerable amount of property is to be destroyed; these and other things have all to be reckoned with. In any case, and under the most favourable circumstances, the new scheme, with the purchase of any valuable assets that may belong to the water companies, could not, we think, cost less than about 55 million pounds sterling.

In conclusion, the scheme cannot be said, in principle, to be absolutely novel, as something like it was proposed as long ago as 1869 by Mr. H. H. Fulton, C.E., while Messrs. Hassard & Tyrell, C.E., have written much to show the availability of the Wye and Usk for London's water supply. But the Report now given differs in important details from others, and is deserving of being regarded as practically a new scheme. It is a farce, however, for the Engineer to call his document a "Report on Available Sources of Water Supply for London," for it (with appendix) is only seventeen pages in length, and all other proposed sources than those alluded to in Wales are "dismissed with a caution."

BOOK-PLATES.

THE collecting of book-plates is a harmless if not a very intellectual hobby; it is something higher than the collecting of postage stamps, but altogether behind the amassing of prints, etchings or old china. It has only become a pursuit in this country during the last twenty years, though here and there in earlier days a single individual may have got together a number of book-plates. But in 1880, Lord de Tabley published a "Guide to the Study of Book-plates," and since then we have had, in Mr. Hardy's and Mr. Castle's books, new and more popular works. The St. Luke's Society also now publishes a journal, and the knowledge of book-plates has become in these latter days the trade of a band of connoisseurs. There is no subject under the sun which cannot become an interesting study if time and thought are given to it, to follow out its ramifications and to compare its details. We have no wish, therefore, to throw cold water on the study and collection of book-plates, for the more hobbies there are the greater are the sources of human happiness. But, relatively, the book-plates of the past have not usually been of much importance, either artistically or historically. Here and there we may come across one of the old heraldic types of book-plate with a finely-designed "mantle," or a powerful bit of decorative fancy by Dürer, or an undecorative but picturesque corner of a landscape cut on wood by Bewick. But for the most part the design is commonplace in an artistic sense, and throws very little light on any part of the details of history.

The object of book-plates was, and is, to indicate the ownership of the volume in which they are placed. So late as 1676 the word itself does not seem to have been in use, for in that year Loggan, an engraver of some note, wrote to Sir Thomas Isham speaking of "a print of your coat of arms." In 1791 Horace Walpole describes his book-plate as his "seal," so that it was really not until the beginning of the present century that the term came into general use. Most of the earlier book-plates were simply the coat-of-arms of the owner, with a background of a mantle. The name of the possessor of the work did not appear; the coat-of-arms was a sufficient indication of the ownership. As coats-of-arms became more numerous, there appeared in addition the name of the owner, a combination which was really unnecessary, though it may nearly always be seen at the present day, since, as already pointed out, the coat-of-arms was no place for the name. Yet later—roughly speaking from the beginning of the eighteenth century—the coat-of-arms disappeared, and its place was taken by some kind of drawing, often allegorical, sometimes

realistic—as in the depiction of the owner's library; sometimes picturesque, as in the book-plate executed for Southey by Bewick, about the year 1810, in which "we have a rock thickly crowned with shrubbery from which a stream of water falls into the brook below. Against the face of the rock leans an armorial shield bearing the Southey arms. On the ground to the right of the shield, and in contact with it, is the helmet, supporting on a wreath the crest, an arm vested and couped at the elbow, holding in the hand a crossed crosslet. Across the sinister chief corner of the shield and trailing thence to the ground is thrown the ribbon bearing the motto, 'In labore quies.'" Altogether, as depicted in Mr. Hardy's book, this is a very graceful bit of work, wanting, however, one practical essential—namely, that no one unacquainted with the Southey's arms would know to whom a book in which the plate was inserted belonged. Much more practical is the plate which was used by David Garrick, which is also shown in this volume. The name appears in the centre on what may be described as an oblong panel with rather florid bordering, and surmounted by a bust of Shakespeare, below is a harp, a dagger, a crown and a cup, and the motto, "La première chose qu'on doit faire quand on a emprunté un livre, c'est de le lire afin de pouvoir le rendre plutôt." It is in truth these special book-plates of an original character which have the most interest, but the persons who executed these, if we except one or two men such as Hogarth and Bewick, were not possessed of sufficient artistic power to render the plates important as works of art. In the earlier book-plates there is a certain difference in the style; first we have a simple armorial style, with occasional difference of treatment in the mantling: then, about the Stuart period, we come to the Jacobean style, in which the shield is surrounded by very florid ornamentation, often with brackets and figures, or bust. Curiously enough, after this style died out, the style of ornamentation of furniture brought into vogue by Chippendale in the middle of the eighteenth century was copied by the designers of book-plates. So akin are the ornaments of book-plates to those of arm-chairs and table-legs at the period that the style is known among collectors as the Chippendale style, showing how little individuality was possessed by the persons who, at this date, were employed to design book-plates. The servile following of furniture designs continued to a later period, since then arose "the 'wreath and ribbon' style, which very closely resembled the decoration which Thomas Sheraton suggested for contemporary furniture." But wreaths and ribbons really formed a great deal of the artistic expression of the time, if artistic it can be called, and Sheraton furniture and the book-plates of the day were, probably, only two forms of the general style of decoration then in vogue. Those which depict interiors, such as the very elaborate book-plate of Lady Oxford, dated 1731, have, occasionally, some architectural interest. A portion of a library is shown in this plate, and through a doorway in the centre, flanked by Corinthian pillars, a view is obtained of a country house which stands in a park. A collection of interiors of libraries as shown in book-plates would probably be of some value, while those executed by Hogarth or Bewick have an interest and an importance, not because they are book-plates, but because they are executed by men whose works have attained a standard value in the world of art.

Those who wish to become acquainted with the character of quite modern book-plates must refer to Mr. Castle's pages—a very considerable part of his work deals with this portion of the subject. An attempt is made to classify this series, as by introducing the term "modern Die-Sinker style," but the divisions are not satisfactory; they do little more than explain one feature of the modern plates. The latter

are, in truth, of all kinds, but many of them are interesting, either from their designer or from the design, and sometimes from both causes. Thus, for example, the book-plate of Mr. Christopher Sykes, by Sir John Millais, is very attractive. The allegory bears on the owner's Christian name, and illustrates the legend of St. Christopher bearing Christ across the water. The figure subject, though sufficiently shown to identify the legend, is partially hidden by the triangular escutcheon, which is linked on to the oval frame of the design in a peculiarly ingenious manner, the whole forming a little masterpiece of decorative and symbolic design. Mr. Walter Crane's book-plate, designed by himself, is very pretty and decorative, as might have been expected; his design made for Mr. Walter Besant is too pictorial. A striking design, printed in colour, given in Mr. Castle's book, is that made by Mr. Bernard Partridge for Sir Henry Irving, and which seems, from the anecdote given in the book, to have puzzled its possessor; who, however, like Mr. Castle, made a mistake in seeking for an emblematic signification in it. There is no necessity for a book-plate to be emblematic, and it is pretty evident that the author of this design simply intended to make an effective combination of line and colour, in which he has thoroughly succeeded. It consists of a very boldly-designed scroll ornament in thick black lines, with a bright red heraldic bird whose head and wings emerge from the scroll, the body being, as it were, wrapped up in it. The owner, on being appealed to for a meaning, said it was designed by Mr. Partridge, "though there was nothing of that bird in the composition"; but suggested it might have been intended to represent "a glorified sandwich man with a Lyceum pillbox."

Whatever may be thought of the paucity of artistic quality in old book-plates, we do not think the same charge can be brought against the modern ones, as a rule. On the contrary, it is surprising to notice what an amount of artistic taste, variety, and invention is now bestowed on the designing of book-plates. In the present revival of the feeling for decorative effect in composition, the book-plate forms a new field for the exercise of artistic design and fancy quite as fertile as the "poster," and for the most part permitting and encouraging a more refined style and sentiment than is generally suitable for a poster. And we confess that the interest of the subject lies, to our mind, much less in the collection of old book-plates than in the design of new ones, and that the book-plates of the present will really possess a kind of value of which those of earlier times were for the most part destitute.

NOTES.

TH reference to our article in last issue on "A Question of Church Style," in which we suggested that the interior of the Roman Catholic Church at Chelsea, illustrated in the same number, was architecturally rather suggestive of a concert-hall or reception-hall than a church, we have received a communication from the architect, Mr. E. Goldie, intimating that in regard to his own feelings, he is not much at variance with us. The Classic style for the church, as we understand, was prescribed in general terms by his clients, but the design as first made by the architect was very different from that carried out and illustrated. His design was for a church with a three-aisled nave in the western portion, spreading out into a domical treatment over an open floor in the eastern portion of the nave, which would not have had the secular effect that we attributed to the design as carried out. Various circumstances necessitated the modification of the design into the form shown in our illustration: partly the question of cost, which led to the abandonment of the dome; partly the necessity of contracting the site in accordance with

the requirements of the London County Council in regard to the boundaries and the width of the adjoining road. As it was desired that the central avenue of the nave should not be made narrower than that provided in the original three-aisled plan, the ultimate result was that the interior was reduced to the one-aisled form shown in our illustration, the portion of the space at each side, left from the original width of the aisles, being treated as a series of chapels within recessed arches. It may be fully admitted that Mr. Goldie made the best with the design that was possible under the circumstances. In a future issue we will give the plan and a view of the interior as originally designed, showing what the architect's idea was, had he been able to carry it out.

ON Tuesday last the new American School on the Pincian Hill, Rome, was formally opened. To secure uniformity with the school at Athens the new institution is to bear the name, "American School of Classical Studies in Rome," but the title will be somewhat misleading, as the Early Christian, Mediæval, and Early Renaissance periods, both in art and literature, will come within its scope. The first steps towards organising the school were taken at a meeting in Philadelphia last autumn, under the *ægis* of the Archeological Institute of America. Great enthusiasm about the project was promptly shown, and a fund was quickly raised, adequate to the support of the school for three tentative years. Chicago, Boston, Philadelphia, Baltimore, besides many other places, have subscribed liberally. The school will have its home in the Casino dell' Aurora, which it will share with the American School of Architecture, and with schools of sculpture and painting. Professor Hale is appointed as Director; the Sub-Director will be Mr. H. L. Fotheringham. Regular courses of lectures will be given, and studentships—or, as the Americans call them, fellowships—will be awarded. Besides the regular courses, the directors propose to carry out a great deal of informal teaching work in the Museum, and *in situ* at the various excavations.

THE Bradford Technical College is to be congratulated on having made an important addition to its establishment in the acquirement, at a cost of considerably over 1,000*l.*, of a 100-ton Buckton testing-machine, for which it is understood that they are indebted in great measure to the generosity of the late chairman of the engineering department, Mr. George Hodgson. Mr. Charnock, the present head-master of the Engineering School, gave a lecture on the uses of the testing-machine on Thursday last week. The provision of such a machine is an advanced step for a Provincial Technical College to undertake, and it will, no doubt, not only be an important factor in the instruction work of the school, but also afford a most useful testing centre for engineers and architects in the neighbourhood of Bradford.

THE opening of the Bristol Electric Tramway on Monday inaugurates a new era in the electric tramway industry. Although not the first in this country, it is the first that has had to conform to the Board of Trade rules for the regulation of electric traction. Several municipal authorities have recently appointed committees to investigate the working of electric tramways, and there is no doubt that the system adopted at Bristol, embodying as it does the best points in American practice, will have many imitators. The line is four miles long, extending from near the centre of the town to the flourishing suburbs of St. George and Kingswood, which have a population of nearly 60,000. A double track is employed except where the narrowness of the streets necessitates a single line. The trolley wires are the most distinctive

part of the system. They are supported from ornamental standards with double arms where the streets are wide, and from standards with single arms where the streets are narrow. The old arc lamp-poles have been removed, and the street lights are supported from the trolley standards. Altogether, the trolley wires are very unobtrusive, and all manner of precautions have been taken to prevent accidents. The trolley is attached to a stand 6 ft. above the car, and its little wheel running along the rails conducts the current to the two motors in the car, the current being returned by the rails "feeders." To meet the Board of Trade requirements the rails have been unusually heavy, weighing 76 lbs. to the yard. The necessity for this is to prevent the corrosion of water- and gas-pipes by other electrolytic troubles caused by leakage of the electric current. The electricity generating plant consists of three speeds continuous current machines of Thomson-Houston type, which supply energy at a pressure of 550 volts. As aggregate horse-power of these machines over 400, and there are only twelve cars, cars go up steep gradients with the greatest ease, in one place the lines rising 40 to 200 yds. The cars, which have been made by an English firm, have seats on the rails in this respect quite unlike American cars, and are lighted both by accumulators from the trolley wires. The British Thomson-Houston Company were the contractor for the whole of the work, which has involved an outlay of nearly 55,000*l.*

MR. JOHN HOLDEN, the President of the Manchester Society of Architects, has published a paper, which he reads "Ancient Lights," to the Sheffield Society of Architects and Surveyors. It is a epitome of the law on this important subject and shows a remarkable knowledge and appreciation of the legal decisions. At the point of view of a lecture, there is much detail in the paper, and too great dwelling on case-law, and it must have been singularly uninteresting to listen to. To print it is a useful little publication, though the student will find it somewhat scrappy. Lectures, as far as possible, should think, deal with a subject broadly: it is impossible to go into all details in an hour or two. If some legal decisions are mentioned with much particularity, there must be some exclusion of others. But few men really gifted lecturers, and architects feel a satisfaction at observing how well acquainted a member of their profession make himself with the legal aspect of subjects which engage his attention during his professional day.

A CORRESPONDENT sends us the conditions of the competition for a hotel at Weymouth, drawing our attention to the requirement that designs are to be accompanied by a tender from a responsible builder to erect the buildings not less than 17,000*l.*, and asks if such a *bona-fide* tender is to be obtained without quantities being taken out, who is to pay for the quantities? provision is not new in competition conditions, and we fear that competing architects have rather brought that kind of thing on themselves by their constant tendency to send in designs which could not be carried out for the proposed cost. But it is, of course, impossible for a builder to take within a narrow limit on a set of competition drawings; a margin of 10 per cent. should be allowed. If a committee, however, appoints a competent assessor, he will be able to determine whether a design is approximately in line with the proposed outlay, and approximately all that can be expected on the basis of competition plans. Other features in the competition look very bad; it was admitted in the first instance "to architects and others," a very suspicious phrase; and the Corporation propose to retain as their

property the three sets of plans for which they shall have paid the premiums of 200*l.*, 100*l.*, and 50*l.* respectively, and the right to carry out the first design, or any part of it, without any reference to the architect. No architect of any standing will have anything to do with them on those terms, they may be assured.

WE read in an extract from a French newspaper, which has been sent to us, an account of a fatal accident at a saw-mill, when "un énorme éclat de bois se détachait," hitting a workman in the side and killing him. An "énorme éclat" means, we presume, a large splinter. French newspapers are so given to sensational statements that one may feel some doubt as to the precise accuracy of the description of what occurred; but if the account is correct it seems to suggest a danger to be guarded against in saw-mills.

WE have received from Mr. J. Pattison Gibson, of Hexham, a selection of lantern-slides of architectural subjects, which seem exceedingly sharp and well-executed. Architectural subjects for the lantern are not too numerous, and in the provinces especially there is often a good deal of difficulty in procuring any, so that those who wish for illustrations of that kind for lectures and other purposes may be glad to hear of these.

THE Bishop of London is about to issue a commission of inquiry, under the Union of Benefices Acts, as to the expediency of uniting the benefices of St. George, Botolph-lane, and St. Margaret Pattens, Rood-lane. Each of these parish churches was built by Wren; the former has been closed, we are informed, for some while past, and it seems, will eventually be pulled down if the projected union is accomplished. St. George's Church was finished in 1674, having cost 4,510*l.*; it is built of stone, and the design, whilst presenting no particularly striking features, is worthy of notice as embodying two or three characteristics of the architect's London churches—a simple tower, of good proportions, rising in three stages from the ground, a pedimented east-end, and a basement story unbroken by doorway or window, the entrance being in the tower. The windows, excepting those in the tower, are segmental-headed. The tower is 16 ft. square at the base; its panelled parapet has angle-piers on which rest urn-shaped pinnacles. A report upon the fabric's condition was made five years ago by the late Ewan Christian, for purposes of the London Parochial Charities Act, to the Charity Commissioners, who were advised that a sum of 2,700*l.* would be necessary for a restoration of the church. The rectory had belonged to Bermondsey Abbey, but at the Suppression it passed to the Crown. Since the Great Fire this church has served for the united parishes of St. George and St. Botolph, Billingsgate. The latter church stood in Lower Thames-street, being one of the four London churches with that dedication situated by a gate. Stow tells us that St. Margaret Pattens derives its name from the circumstance that in olden time pattens were usually made and sold in what is now Rood-lane. The lane took its later name from a rood placed in the churchyard whilst the church was being rebuilt; the rood, with its tabernacle or shrine, was found destroyed one morning in May, 1538. The tower, rising three stories above the church parapet, is more ornate than that of St. George's. It has flat pilasters at the angles; above the cornice are a balustrade and angle-piers, which carry tall obelisk pinnacles. The octagonal leaden spire is panelled on each face up to its apex, and pierced with small-sized openings. It is the most lofty of all the similar lead lanterns or spires by Wren, attaining, with the tower (which is 22 ft. square), to an elevation of 198 ft., and forming a conspicuous object in the group in this quarter

of the City. In this church are an altar-piece ascribed to Carlo Maratti, a monument by Rysbrack to Alderman Sir Peter Delmé, *obit* 1728, and some finely-carved flowers and foliage above the altar and on the organ-case; the mantling of the Royal Arms is also beautifully executed.

A PROPOS of the project to set up a memorial to Mrs. Siddons at Paddington we may mention that in 1881 Mr. Gibson Craig, of Edinburgh, presented a fine likeness of her to our National Portrait Gallery. It consists of an alto-relievo, in white marble, by Thomas Campbell, originally intended, as we understand, for Westminster Abbey, and purchased by Mr. Gibson Craig at the sale of the sculptor's effects in 1858. The erection of her monument in the Abbey is due to the efforts of Macready, who first mooted his idea at a dinner of the Garrick Club, July 3, 1834. Certain entries in his journals* seem to show that its execution was to have been entrusted to Chantrey. But whilst the statue there is said by Dean Stanley,† Baedeker's Guide, and similar books, to be by Chantrey, its pedestal is inscribed: "Tho. Campbell, sculp. 1845." Chantrey died on November 25, 1841; in March of that year a committee had been appointed for the erection of a statue or bust in the Abbey. On the question of authorship the following passages in Macready's Diary are important:—

November 18, 1845.—Called on Campbell; saw the Siddons statue. He wanted 500*l.* I told him I would be responsible for the 400, and if I could get him more I would. He was satisfied.

June 9, 1848.—Walked on to Campbell's; saw the statue of Mrs. Siddons.

September 6, 1849.—Went with Katie to Westminster Abbey; saw the statue of Mrs. Siddons.

Chantrey had chosen the position, in St. Andrew's Chapel, for that statue, which, in the opinion of many, is inferior to Campbell's work, in relief, on the score of both faithful portraiture and artistic merit. Chantrey had expressed himself as being in favour of a portrait bust or figure, being quite averse to anything in the form of an allegorical or symbolical device.

THE fifth exhibition of the Society of Portrait Painters, opened a few days ago at the new Gallery, has variety enough, but it suggests to a curious extent how entirely we are without any recognised or recognisable school in portrait painting. All kinds of systems of treating portraiture are illustrated in it. There are those in which a mere representation of the original, in as realistic a manner as possible, is the painter's object. There are others in which pictorial effect is the object, but a pictorial effect depending in some cases on the treatment and lighting of the head, in other cases on the costume, in others on the combination of the figure with accessories or landscape. Then there is the archaeological portrait, such as Mr. Herman Herkomer's (35), a deliberate imitation of Gainsborough. The frankly realistic portraits may be divided into those which are hard and wooden in texture and crude in colour, and those which combine generally realistic effect with harmonious colour and a rich texture. In these the picture is in fact not treated with absolute realism, but it suggests to the average spectator a realistic likeness. In this class of portraits Mr. Wirgman is especially successful; see his "Sir Henry Davies" for instance (26). Mr. Lavery, in several in many respects fine pictures, disappoints us in the fact that while the costume is admirably painted and the pose and drawing of the figure always good, the face is, as a matter of colour and texture, the least successful portion of the whole; the flesh looks dead and pale. Mr. Hacker's portrait of Mr. Tomlinson (15) is a capital specimen of the kind of highly-finished

* "Macready's Reminiscences, and Selections from his Diaries and Letters," edited by Sir Fredk. Pollock, Bart., 1896.

† "Historical Memorials of Westminster Abbey"; fifth edition, with the author's final revisions, 1882.

realistic portrait which just escapes hardness; M. Carolus Duran is just over the line in his brilliant half-length of Herr Thaulow, which is hard and over-accentuated. Mr. Cope has dealt very ably and in a broad artistic style with "Lord Crawshaw" (34) in hunting costume. Among the portraits which depend for their principal effect on the treatment of costume, Mr. Olivier's "Mrs. Baillie of Dochfour" (38) is clever and effective, if a little theatrical. Mr. C. N. Kennedy's portrait of Mrs. Kennedy (77) is something more than a costume portrait, though a great deal of the effect depends on the colour of the dress and sofa-cover, but the head is finely painted also. The finest work by far in the collection, and which is alone worth going to see, is Mr. G. F. Watts's exquisite half-length portrait (27) of an old lady, one of the most spiritual things which he has ever produced, beside which the best of the others seem rather commonplace.

THE correspondence in the *Times* on the subject of Hyde Park has been characterised by a somewhat Pharisaical tone. Anyone who was not in the best of clothes who has frequented it has been set down as a "tramp." There is no doubt that any practice such as washing at the fountains, and dressing under the trees, and so forth, should be stopped. But on the other hand, nothing could be worse than to try to keep Hyde Park for what are comprehensively called well-to-do people. It is a tribute to the usefulness of open spaces that the poor and distressed go to Hyde Park, and enjoy some fresh air and pleasant vegetation: it answers its best purpose when it becomes a place of enjoyment to the masses. The Sunday preaching and political haranguing are another matter, and in our opinion should be stopped on the same principle—that although they may amuse a few loafers, to the general public, high-born and low-born alike, they are an unmitigated nuisance, and spoil the legitimate enjoyment of the Park.

THE ARCHITECTURAL ASSOCIATION: ANNUAL MEETING.

THE opening meeting of the present session of this Association was held on the 11th inst. in the meeting-room of the Royal Institute of British Architects. Mr. W. D. Caroe (President) occupied the chair, and there was a large attendance.

On the motion of Mr. F. T. W. Goldsmith, seconded by Mr. A. B. Pite, the Committee's report for 1894-5 was unanimously adopted.

Mr. H. W. Pratt (Hon. Treasurer) next proposed the adoption of the balance-sheet. He was sorry that the accounts were not quite so good as those of last year; still, there was a substantial sum of money in hand. He also proposed a vote of thanks to the Hon. Auditors, Messrs. Sim and Buss.

Mr. Hooper seconded the motion, which was agreed to.

Several donations to the library were announced, and votes of thanks were accorded to the givers.

The Chairman announced that the *Conversazione* would take place on Friday, the 25th inst., and that tickets might be obtained for members' friends at 2s. 6d. each.

On the motion of Mr. B. F. Fletcher (Hon. Sec.) cordial votes of thanks were passed to those gentlemen who had allowed the members to go over their buildings during the A.A. excursion.

The names of forty-one applicants for admission into the Association were next read.

The Chairman then presented the prizes for Session 1894-95, the following being the full list:—

MEDALS AND PRIZES.

Session 1894-5.

A. I. Travelling Studentship (Bourse Medal) H. J. Triggs.

Measured Drawings Prize: A. Bryer.

Essay Prize (Silver Medal): T. E. Abbott.

Mr. James Brooks Prize: P. K. Smith.

Discussion Section Prize: C. H. Fowler.

Oliver Prize: H. C. R. Hide, first prize; A. J. Roddis, second prize.

List of Medallists, Session 1894-5.

Division I.: E. P. Wheeler, silver medal; A. Smithers, bronze medal; C. F. Dawson, hon.

mention. *Division II.*: P. J. Groom, silver medal; E. Bates, bronze medal; E. H. Evans, hon. mention. *Division III.*: C. W. Surrey, silver medal; A. H. Allan, bronze medal; F. Catling, hon. mention.

Studio.

Division I.: H. C. Bathurst, silver medal; C. Martin, bronze medal; J. G. N. Clift, hon. mention. *Division II.*: H. C. Trimmell, silver medal; H. C. R. Hide, bronze medal; S. Perkins, hon. mention. *Division III.*: J. R. Stark, silver medal; J. Hunt, bronze medal; J. W. Abraham, hon. mention.

List of Prizes and Certificates.

Division I.: E. P. Wheeler, Certificate and Prize, Greek and Roman Orders; A. Smithers, Certificate and Prize, Materials and Construction; A. Smithers and E. P. Wheeler, Certificates, Perspective; C. F. Dawson, Certificate and Prize, Elementary Physics. *Division II.*: E. H. Evans, Certificate and Prize, English Architecture; G. H. Paine, Certificate and Prize, Materials; S. Perkins, Certificate and Prize, Elementary Ornament; P. J. Groom, Certificate and Prize, Stresses and Strains. *Division III.*: P. W. Meredith, Certificate and Prize, Practical Design.

Extra Subjects.

E. P. Wheeler, Certificate and Prize, Plane and Solid Geometry; W. Hearn, Certificate and Prize, Land Surveying; C. W. Surrey, Certificate, Quantity Surveying; H. C. Lander and A. T. Griffith, Certificates and Prize, Modelling.

The Chairman then delivered the following address:—

President's Address.

There is no need of explanation or apology if in addressing you to-night my first word is of architectural education. We represent the foremost educational body in matters architectural which has existed in the country, and this year has seen new needs and new developments in our systems, which call inevitably for explanation and remark. We exist primarily and expressly as an educational force, and have so existed for nearly fifty years, and our history groups itself entirely around this object, and shows this as our original and ultimate end.

It was the perception of the thousand difficulties which surrounded the path of the student of architecture when left unaided to plod alone through problems technical, archaeological, and artistic, that prompted Mr. Gray, forty-eight years ago, to write to our constant friend, the *Builder*, stating the want of some institution for the study of architecture, which led to the collaboration of Mr. Kerr and Mr. Gray in creating, from the embers of a not too prosperous benefit society of architectural draughtsmen, the Architectural Association, with Mr. Kerr as its first President, and education as the keynote of its existence and the subject-matter of Mr. Kerr's initiatory address. May I say here with how much pleasure we all look forward to doing honour to the author of that address, and of our being, when we keep our Jubilee in the year of grace 1897? Our initiator may feel justly proud of the fruits of his action of nearly fifty years ago, and of the progress and influence of this his fledgling; while we in our turn are proud to have with us our *doyen* and first President, who was ready when the society needed his help to step in and take his place among the number of our instructors.

Since these, our beginnings, we have had some necessary changes in our methods of education; from the system of instruction by mutual criticism has grown that of instruction by voluntary visitors, which continued until 1891, and made our classes so deservedly popular.

Towards the close of the last decade, however, it became evident that some change would be inevitable. The influence of the new condition of things at the Institute was making itself felt. The Voluntary Examination of former years had developed in 1882 into the compulsory examination for admission to Associateship of the R.I.B.A., which brought at once in its train the coaches and crammers and unprofitable facts of all examinations, with the divided camps of those who hated and those who supported; those who believed and those who denied; Memorialists and Societies for the Propagation of Registration Bills; and we were all by the ears with a new system and other standards erected among us, to be approved or disapproved as our temperament leads us, but necessary to be acknowledged and dealt with as with existent facts.

Exactly five years ago your past President, Mr. Stokes, addressed you from this chair, and the burden of his words was this—that systematic teaching had become a *sine quâ non*, that we should memorialise the Institute either to undertake this teaching itself, or to help us to do so;

the result of which memorial was the handsome grant made by the Institute to us as an educational body—this function of education remaining with us. This grant was made and has been continued in a broad and liberal spirit; despite the controversies, not only among the profession at large, but among our own ranks as to its policy—no conditions have been attached by the Institute to our acceptance of its bounty; and we undertook the reform in our system with a will. As has always been the case with us, the chief energies of our officers were devoted to the admirable task of perfecting and improving our schools and our system of education, of revising them as new needs demand, and of bringing them into direct agreement with the requirements of the time. This task, this revision, constituting one may say a revolution in all our former methods, was as difficult of accomplishment as it was deftly accomplished; and to the movers and workers of that year the Architectural Association should, I affirm, look back always, as to its protagonists and heroes!

We now have before us the results of four years' working of the new scheme, and you are aware that in the year 1893-4 we had the satisfaction of proving that even without the aid of the Institute the new scheme could be made financially successful, leaving us with a substantial balance.

But a meeting of the ways has come, and other causes have been at work which demand a new adjustment. The session just past does not show the desired continuation of this success, and though more has been made of fortune's fickleness than is perhaps necessary, yet we have to regret a considerable falling off in our students as well as in the number of our new members, though the work done in our Classes and Studios has been of first-rate quality. Your Committee set itself to fathom the cause, if cause there were, of the dwindling numbers, and worked with characteristic energy. Past-Presidents, Committee-men, Instructors met in conclave to discuss the situation; the views of the most competent and advanced students were sought as to any deficiencies found by them in the working of the curriculum, and finally a special committee was formed to investigate and to report upon the whole scheme.

That committee worked as A.A. committees know how to work, and perhaps you will permit me, as its Chairman, to give you my own views upon the slackening of our success of last session as compared with the session before it. It was, I believe, due to passing and not to permanent causes—nor is there ground here for any pessimistic cry that our prime is past and our *racoco* period upon us. It is obvious that the number of incipient architects cannot be absolutely the same, session by session, and we must at all times have our fat and lean years. It is not unlikely that the lean should come when trade is proverbially bad. I suspect also that the discomforts of our too small rooms, when crowded almost to overflowing, as they were the session before, have had something to do with the decrease in our numbers of this year. But apart from these, other causes have also been at work, and first of these we may consider the re-organisation of the examinations at the Institute.

Whether acknowledged or not, it was undoubtedly in the consciousness of those who framed our curriculum four years ago, that our course of study might be helpful to students preparing for the Institute Examinations—indeed, that such students would be attracted by it. Nevertheless, although spoken of, the exact dovetailing of our course of study with the date of the Institute Examinations has never yet been achieved. So that a student sitting for examination must either sacrifice some part, and that the final part, of his studies in our schools, or must delay the date of his examination until six or seven months after his study for it here was complete.

Now, gentlemen, I touch upon the pith of my address to you to-night, viz., Shall our course of study acknowledge these examinations and aid in preparing for them? or, shall we stand aside on the neutral ground of giving a good and thorough architectural education, *not* of a nature to be best tested by examination alone? or again, shall we oppose these new tests of a merely stereotyped efficiency by formulating our scheme on different lines, and with an intentional disregard to the standards and arrangements of the Institute examiners?

I hope I shall have you with me when you have heard the arguments for the resolution at which your Committee has arrived, and in delivering my message I should like to make my own position clear, having myself been a Memo-

rialist, and holding still every jot and tittle of the beliefs that that body strove to make clear, differing only from it in its final and exaggerated antagonism to the Institute. The world of education has, as we all know, for years been passing through the fire of examination, and yet Moloch is not appeased; yet upon all sides we hear that the test has not proved itself the purifying medium and final court of appeal that sanguine generation supposed it. It is notable that the Institute has only come in at the finish, lighting its torches when others are putting out or trying to assuage the flames. I have a certain measure of real hope that before many years are out the most eager advocates of architecture by examination will have found that no form of diploma, no corollary of significant letters, will in any way advance the cause we have all at heart; but that these weighty degrees may ever prove something almost akin to a burden upon their bearers and an imposition upon the public, our employers. Already I hear whisperings of the failure of these ideals so plausible and promising; how the man who was safest in mark is not the surest in merit; in short, that condensed nutrition sometimes suffers in the timing. The examination is the safeguard of those alone who look no further than an official guarantee of stereotyped efficiency—the terror of those whose hope is for the freest and fullest development of the artistic spirit. Now, the safeguard is not always safe; but the terror is always terrible!

Nevertheless, I know well that our modern world will never more be persuaded to run its appointed course off its chosen rails of degree and diploma—the examination in some form or other we shall always have with us; and to some natures, to some types of mind, it may possibly be not only necessary, but expedient.

It seems to me that we must admit this necessity, and must acknowledge the dangers of this modern tendency, and must arrange both our own scheme of life and the curriculum of the Architectural Association accordingly.

Whatever be our views of the effect, helpful or hurtful, of organised examination, it exists; Conduit-street—a positive institution, a factor in the making of the career of a large body of aspirants to our calling and to the life-work which it involves. Critics, memorialists, societies, may fret as they will—none of our cries has effect upon the one fact that the examination exists and is popular; as matters go at present, whether fit food or for evil, an ever-increasing body of candidates press in. Now if, in the ever memorabilia words of Silas Wegg, "The nose must be brought to the grindstone," though I, for my part, cannot admit that noses were ever intended for, or were ever improved by, grinding; yet, still further to mix his mixed metaphor—if the nose *must* be ground I will do my part, at least, to make it of tempered steel, and will only rejoice—apart and on occasion—that in my day (and Mr. Boffin's) "the sound of the grinding was low."

Now the only way in which we can combat the examination evils—the cramming, the ill-digested knowledge, the triumph of superficial facility over the slower strength of original thought, of mere curriculum cram over artistic research; the one way in which the examination itself can possibly be made to serve a useful end, is by the provision of an adequate, thorough, and intelligent education for the many-sided calling of an architect which may be undertaken both before and incident with the practical training of pupillage, which may be thoroughly assimilated and solidly acquired, and which shall maintain as its standard and its keynote that "cramming shall not be."

Shall we refuse our aid to the student who entering the profession by an honourable road, recognised by the period in which we live? Shall we tell him to prepare himself as best he may, but that we know nought of examinations or their needs? let him seek a crammer that ill victim may be decked for the altar!

If we do this I say that we lay down our charter of education, if we do this we have no longer a right to our standing of fifty years. We are here to teach of truth and beauty and knowledge; the better we can do this the less harm can come to the world from the deadening grind of the treadmill. The more we can tempt to the teaching, the more freed men there will be from the teachers of learning to come.

We have so often agreed upon the main need of an architect's education that it is enough to restate them concisely.

(1.) That the system of pupillage or apprenticeship is good as far as it goes, but that it does not go far enough.

(2.) That it should be supplemented by systematic training by skilled instructors.

(3.) That that training should be directed to stimulate the artistic faculty—to order the imagination, to give the necessary practical as well as theoretical knowledge in all the accessories of the craft; in short, should consist of work in studio, lectures, class-rooms, and in Workshop.

Such being the general statement of the views to which much discussion and experience have brought us, it seems unnecessary to amplify or to repeat the arguments which we have both heard and read so often during the last decade.

Four years ago, when your Past-President, Mr. Baggallay, explained our new scheme to the Institute, in an address full of insight and force, his chief point was conveyed in the words, "We believe students want a course which will lead them up to your examinations, and we believe they are willing to pay a modest sum for such a course." The Committee has accordingly decided to bring classes and studio work into line with the requirements of students for the examinations. Such students will find all their needs fully considered and provided for. The Institute has met us half-way, and altered the dates of its summer examinations, both intermediate and final, to suit our classes. At the same time, we leave it to the free will of our students to enter for the examinations or not, as they think fit; and we continue a goodly number of classes which are quite beyond examination requirements, but which we recommend to every earnest student who desires the best and fullest instruction in the matters of his art which lie within the scope of a teacher. But we go further in an opposite direction to that suggested by mere preparation for examinations. Before 1891 all classes were on the self-help system, the chief of them being those of design, elementary and advanced; it was never intended that the advantages or methods of these very popular classes should cease, as Mr Baggallay explains very clearly in the address to which we have alluded. These anticipations having hardly fulfilled themselves in this respect, we have, therefore, formally re-instituted these old classes, with their excellent system of visitors, upon a basis that all will, it is hoped, approve—being able to share in gratitude to the visitors and instructors who have allowed themselves to be enrolled upon our lists, and to whom let me now express our indebtedness.

Thus the old and new ways meet, leading us to new features which has been almost a dream for many years past to those connected with the management of the Architectural Association—the establishment of Handicraft Classes. As one who has worked at the bench, has dabbled with modelling clay, and has plastered walls and set masonry, it is necessary again to argue from this chair the advantages to be secured by an intimate practical acquaintance with the handling and fittest treatment of materials—the proper employment of which is the root and branch of all good design, all architecture worthy the name.

I do not say it is necessary for us to be as highly skilled in each craft as a life-long labour has made its industrious artisan, but we do want to be able to handle materials intelligently, and to have constant opportunities of watching others handle them deftly; and this practical training is much the more helpful if it is acquired side by side with the more theoretic knowledge evolved from the lessons of the past, a mastery of which will help us to avoid the pitfalls into which even skilled artisan may sometimes lead us, when by ignorance of proper principle he may prostitute his skill to the destruction of his art.

It seems a wasteful policy to multiply classes in any subject beyond the demand for them, and inasmuch as some excellent Handicraft Classes already exist in the Metropolis, it would seem to be a greater advantage to our students to secure for them the entry of these, than to undertake the organisation of competing classes on our own account.

The Polytechnics of Battersea and Chelsea have thrown open their doors to the architectural student, and negotiations are now afoot which, I have every reason to hope, will prove successful for the admittance of our students to the locally convenient and desirable classes, conducted by the Carpenters' Company, at the Trades Training school in Great Titchfield-street.

Thus we have remodelled our teaching, forming one of it anew, making some of it continuous of our happiest traditions of self-help and mutual aid. Some of us are prepared to go further and think it wisdom to consider earnestly if we may not enlarge our borders of usefulness by opening our schools to others outside our elected mem-

bers. A sub-committee has, in fact, reported in favour of this view, subject, of course, to very necessary reservations. In enlarging upon it I should say that I am fully aware much may be forcibly said upon the other side, and I bind no one by giving you my own deliberate conclusions. May we not offer our educational advantages (let us say) to the engineer and the builder, while our social privileges and Association should remain our own, and need in no way be touched by this proposition? As a wealth-seeking nation, we have just cause to be proud of the financial enterprise which develops the value of property, of the triumphs of our engineering skill, justly recognised and eagerly sought to the limits of the civilised world; but as artists what shall we say of the blatant villa, decked out with all the gewgaws of the builder mind; of the railway stations and bridges with their (doubtless clever) iron construction, too often veiled and obscured from our ready admiration by screens of wonderful catalogued "ornament," of a bald facility and probably only possible to cast-iron? What should we say as artists to these great leaders of latter-day civilisation; these guardians and makers of modern domesticity and patriotic enterprise; these builders and engineers who are burdening our land and the whole world with their structural nightmares, but that our banquet is ready, and we will go forth into the utmost parts of the city and (as far as may be) compel them to come in? Let them wander no more unchecked and untaught in their Elysian fields, where a cast-iron bridge is trimmed in the style of the Alhambra and "ornamental iron castings are kept in stock to correspond with every style;" but let us offer to them also the training in thoroughness and knowledge, that their attempts architectural may no longer move us in our lighter moods to laughter, in our sombre moods to "thoughts that do often lie too deep for tears." We have no wish to deprive them of their dabbings in our beloved art, only to bring it home to that common sense of theirs, which is, we are told, so pre-eminent, that the art which can, and does, absorb the best creative instincts of the world's artistic prime cannot be lightly dismissed by selection from a founder's catalogue of castings, or well-deputed to a third-rate architectural ghost. That the engineering pupil shall join in our course, sharing our advantages of handicraft and theory, may assuredly prove as helpful to him in his future as it would be wholesome for the whole world in that his individual theories of proportion and ornament should be no longer developed in our midst. There are, of course, single buildings as well as single engineering works (witness the Forth Bridge) rising or standing about us—works of thought and of power which may fitly range with the worthiest and not be ashamed. But what of the others, the rank and file of so-called architecture—"the houses in between?" It will not justify us in our aloofness that many of these know not the architect, that no pupil of our schools has brought down his pencil to their level. If we are here as a society for the development and study of the practice of architecture, let us open our school also to the builder and teach him the ethics of building.

Meantime, let us put our house in order, that when new learners come, whoever they be, all may be ready; that the all-important question of house-room, which has occupied your Committee so seriously for several years, may be efficiently solved. Our own work has already been much hampered by our narrow and not too convenient limits. This cannot be treated as a question of funds alone, but as a primary need of our continued existence as a successful corporate body, that more adequate accommodation shall be secured within the most suitable locality. An energetic sub-committee has been diligently employed in the search, and has laid a promising proposition before us, which it would as yet be premature to discuss. Should it prove necessary to make an appeal at an early date to the whole body for support, I feel confident that this will be gladly given, not only by members of our own Association, but also by our many friends and well-wishers, within and without the profession. When these new premises are secured, our next ambition must be fulfilled, and day classes started, with day schools of handicraft, a scheme which will probably be approved as much by the masters as by their pupils.

There is another phase of this question of education to which our attention has been lately drawn—a phase of the greatest importance to all who are interested in industrial excellence—the only form of industrial progress for which we architects need greatly care. I refer to the better

education of the British workman. The men themselves have so far stepped in to render our own efforts in this direction abortive. At present the labours of our Committee are in abeyance, though I hope that steps may soon be taken by which these labours may be resumed. Meanwhile we should note that other influential bodies are doing good work in the direction of the revival of the system of apprenticeship, a revival which all who have studied the question, including the artisan himself, seem strenuously to support.

The Plumbers' Company are conferring upon us all, architects as well as plumbers, the first of benefits in encouraging this spread of apprenticeship; by their action a goodly number of youths are yearly advanced in this direction. Other City Companies are also working to the same end, and it behoves us all to further the movement as far as we can. May I suggest that those who interest themselves in this matter, one of so great importance to us as architects, should study the history of the decline and fall of the time-honoured system of apprenticeship, and of the influences at work in the early part of this century, notably, the *laissez faire* doctrine of the school of political economy then asserting itself, although now discredited. Such study will be found as interesting as it must prove helpful in the furtherance of the cause we have at heart.

Not we alone have our ambitions for higher educational advance. This year has seen an entirely new departure in University education at the marvellously energetic and successful Liverpool branch of Victoria University. There is organised a School of Art, of which the head and director is the Roscoe Professor of Fine Art and Professor of Architecture; our esteemed member and late fellow-worker, Professor Simpson, holding the dual post, an amalgamation and a timely recognition of architecture which must not go unnoticed. That the Liverpool University, phenomenally modern and enlightened, eschews the study for diploma examinations in its scheme of architectural education (and even the mention of them) and exalts handicraft as, to my mind, a significant fact, bearing out my own views already urged, and hopes for the future.

The admirable summary of this proposed scheme of education, which has been circulated amongst us, has, as a leading feature, classes for the young student who has not yet entered his pupillage. Provided that care is taken to avoid the danger of too early specialisation at the expense of that general education, of which no man stands more in need than does the architect, there seems much to be said for this proposal. But we need so much beside specific and technical training to make us architects that Gwilt, Fergusson, or Parker make but ill substitutes at an early age for Virgil, Horace, and Homer; nor does a knowledge of the science of thrusts replace the pure mathematics. But this is a matter for parents who would bring up their children to our calling.

Another school, and that at our gates, is said to be in the making, backed by the rates of London, not to be built, we hope, from the ashes of the past by the enterprising L.C.C. Of course the questions must occur to us—Is there room even in London for two important schools to exist side by side? Will a supply of students be found to support both? And, if not, is the L.C.C. wise in attempting competition with an Institution highly organized, full of life and vigour, and whose teaching is based upon half a century's experience? We stand firm in our position. Even the rates cannot supply our staff of visitors and teachers, formed of some of the leading architects of the day, nor the special entries to their buildings while in progress, with the hundred and one other privileges granted to A.A. students alone, and which can only belong to students so long as architectural education remains under the direction of architects themselves, a point of importance in connexion with our schools to which too great prominence cannot be given. If the County Council desires to expend its energy, or the funds at its disposal, in the direction of architectural education, would it not do well to assist us still further to extend our sphere of usefulness? It may be that our position is not as strong a one as we would desire it to be, and hope to make it, but we certainly demur to the statement in Mr. Llewellyn Smith's Report to the Special Committee on Technical Education that we carry on our work "tentatively," or "may at any time fall to the ground." We are neither tentative nor moribund. We are already "a school of architecture," but we are quite ready, under conditions to be agreed, to be developed by the assistance of the Council.

We shall before long have the opportunity of hearing from Mr. Lethaby the direction which it is proposed shall be taken by the proposed L.C.C. Architectural School. His views upon the subject we have already learned in a celebrated and much canvassed volume. "Handicraft" is his keynote and ultimatum; the architect, again the master-builder, shall leave history and theory and learn how to build by building with his own hands, and construction shall come to him in Nature's school through the touch of her materials. To any view of Mr. Lethaby's we shall all listen with the greatest respect and attention, but he has still to reconcile his advocated method of training, itself based upon the achievement of the past, and known to us through history alone, with his demand for the abandonment of all derivative and all teaching from the historical past—also for the application of these his ideals to the accomplished facts and complicated requirements of this our century. We may not be able to unlearn its so-called civilisation, or even to revolutionise its methods, but we may and must resist them when faulty, improve them, better them; and to my mind this can best be done by our reliance upon, and through our knowledge of, the past. We as a craft do not share the proud position of the present-day pressman, with his latter-day superiorities, and his calm consciousness that "whatever is is best." Had we no other need for knowledge, historical and literary, the past glories of our art would take our thoughts to our book-shelves, and our feet to the nearest ruin, to learn from the past its splendid lesson of discontent.

But though our general education is much, and the method of our architectural training is much, yet the spirit that worketh within us is more, and that teaches itself its own best lesson, and goes to Nature herself as the surest help. Educate your eyes, strive to see and understand Nature's harmonies and restraints. We have a heritage, daily dwindling, of characteristic beauty in our English landscape. Let us see that by no act of ours any particle of our inheritance shall be stolen from our sons; let us stand as a remnant—1,200 strong at least—who have not bowed the knee to the Baal of modern vulgarity, 1,200 at least who will refuse to recognise the cry of destruction as that of progress, and who will tenderly keep all their trust of harmony and holiness.

In your sketching of Nature, look for Nature's colours and materials; of buildings, for the spirit of them. Soft washes and pretty outlines make nice albums, but they are not the end of an architect's sketch-book; we want the receipt-book, we want the spirit. A short time ago I saw a sketch, and a fine one too, of Snowdon slaty and sombre, depicting it standing all glorious as a mountain of white chalk or limestone; and another drawing of a beautiful Late Medieval building, in which the most characteristic quality was the irregularity of the bonding, the stones having been cleverly used or placed just as they came to the mason's hand. But in the sketch, amidst all the glories of dexterous chiaroscuro and subtlest perspective, the masonry appeared of the nature of Anglo-Saxon long-and-short work, only more rigid. Such sketching may teach many things—but never architecture; to such blindness and such misconception may we owe the vandalism which has scarred so many a country-side—the ignorance or lack of judgment which has ruined so much antiquity.

I have often noticed the abhorrence of Nature, more especially in her mountain moods, to foreign material or alien colouring, and specially her dislike of red in a grey country. When Manchester saw fit to fill her empty cisterns from beautiful Thirlmere, none of us could feel such a claim unjustifiable; a beneficent Act of Parliament even interposed, to save the district generally, and one of the most attractive and characteristic of our lakes, by ordering the obliteration of all the rubbish and scars necessitated by laying the main. This indeed was done, and fairly well done, and though many feet were added to the lake's soundings, and acres to its expanse, all might have been accomplished so that future generations who had not known the spot before could still have enjoyed the grassy northern slopes of great Helvellyn and the steep opposing rocks of Raven Crag, with no greater distractions from man's handiwork than the hard rigid lines of the modern roads, which, perhaps, we must concede ought to be cut as level as possible. True that a shed was necessary for the turncock, and a dam, but what more useful and seemly than a humble cottage planted round with trees, soon blending with its surroundings as does a

shepherd's hut on the mountain side? And for the dam, why not a noble wall faced with the natural boulders, ready for its clothing of moss and fern and shrub, so beautiful and so characteristic of this country? But now steps in our much vaunted "practical" engineer, who must needs magnify his office. With the everlasting grey stone of the mountains at his feet, he imports for dressings from Scotland a friable conspicuous red stone, and fearful no doubt lest the trolls of the hills resent his intrusion, builds for the glorious housing of his turncock a "romantic" castle, battlemented—parapetted—crenellated—arrow-slitted—machicolated, and, as the crowning feature of his dam wall, itself also battlemented as the curtain of a fortress, he places a "Gothic" tower, which like the castle, exhibits, indeed, as much Gothic feeling as its perpetrator shows perception of artistic fitness. Manchester pays and is happy; the press, headed by the leading Daily, which ought to know better, applauds; not a soul raises a protest, only the thinkers and lovers of nature turn away their faces in disgust from this fresh altar raised to the great latter-day god Vulgarity, to which has been sacrificed ruthlessly, unnecessarily, one of the too few mountain fastnesses of English beauty.

Upon the banks of Winandermere, sacred to greystone, to my mind on one of the most lovely sites in England—there was lately planted a red house, bedizened with the too usual accompaniments of carving, fuss, barge-boards, finials and half-timber work, in feeling and colour as foreign to its surroundings as it is meretricious in design. The local mind is awe-struck; the local lodging-house, hitherto curiously inoffensive and unobtrusive in its local material, blending with the greys and greens of the mountains, starts forth now in half a hundred red brick atrocities planted in rigid rank (fitly called the Esplanade) along a concrete wall, which is raised to stay the lazy ripples of the lake—all fronting—and I find herein a nemesis and my only consolation, the drawing-room windows of the original innovator.

Not in one district alone need we seek our examples. The lovely bay of Lynton, in North Devon, has been ruined in a similar way by the "progressive" action of one man. Beautiful upper Thames side has been visited by the plague of villadom with its worst accompaniments, from the spurious picturesque to the supremest misuse of materials which has, I conceive, been accomplished in the history of man.

This is the first and most important problem with which we have to deal—the choice of material. He who sets himself to think out his design first in line, with a view to settling afterwards the material he will employ, may even live to perpetrate a Tower Bridge or a turncock's castle, and will assuredly instruct that all his bills of quantities shall close with the grotesque words, "alternative for the above if terra-cotta is used instead of stone," as he will doubtless feel that the right treatment of a plastic material is to mimic another which is worked by the tool.

In these days of rapid and easy railway transit, the choice of materials is somewhat freer than in the past, and in the great towns where we have already so heterogeneous a spread of building, imported material must be employed. Yet we generally find that in each town there are certain materials which weather better and look better in the weathering than any others, and we should choose not that which we may think gives us the best immediate effect, but that which past experience shows us to have given the best result when the years have worked their changes. But in the country side, Nature's teaching is almost unerring, and in the use of local material lies safety, harmony, and enduring honour. In its own district, a stone wears best, looks best, weathers best. Where there are trees and loam, there a timber construction will have its best value. Native slates for our roof, where such there are. If the district affords no fitting materials for roof or wall, then our choice must be of those which harmonise the best with the character of the country, and our choice can only prove satisfactory if our eyes have first learned to see.

That all materials are equally beautiful, even in their right locality and surroundings, it would, of course, be absurd to maintain. Nature was not in her happiest mood when she gave purple slates to Llanberis—and to Raubon its clay, with surface and colouring so mechanical and unsympathetic, the invasion of which into the valleys of Wales is a blow to the beauty of Welsh mountain scenery. William Morris once said well that the man who would use Broseley tiles in the country would do any evil thing, and in the same relation as Broseley tiles to the red roofs of Kent and Surrey

are the terrible Welsh slates to those of Cumbria, Cornwall, or Devonshire. Yet even the Welsh slate looks less flimsy and miserable and the Broseley tiles less harsh in their own countries than elsewhere. London alone could well have dispensed entirely with a clay which burns a colour suggestive of malaria and disease, vile in its first effect, and viler in use. Yet even here we cannot say whether Nature was in error in her provision, or man in the using. In most cases she is a faithful guide.

I need not make the glaring examples which I have mentioned of mis-used materials in any way less instructive to us than often they are not the work of architects at all—alas! how many examples could be produced from the works of architects also; notably, the poor expedient to conquer a difficulty so slight, of brick chimneys in a stone country, or a stone structure. In this again, our fathers have showed us a better way would we but walk in it, the problem of material and its solution seeming to them so easy, and to us often as difficult as it is all-important.

Bear in mind that I am not asking you to disregard the all-important question of cost, which may, of course, often influence your choice adversely. This also you must perforce heed, but do not leave the other unheeded. Some of the most glaring examples of misapplied material occur—as in the instances I have given you—when the reverse of economy is the result to be stung.

In the towns our first duty should be to stung our neighbours, never forgetting the demand upon us for our share of a dignified whole—especially when it is our province to treat in the vicinity of an accepted monument—to work an exception site with very special consideration and deference. But few cities can boast a grander river frontage than the banks of the Thames, or a building more worthy of its position than Somerset House. Waterloo Bridge, though not altogether in scale with Chambers' great building, is still a fine creation. What can we say of the erections which rise close by; what of the yellow brick built raised by King's College on the roof of Somerset House itself; here, at the very heart and centre of London's best possibilities? If the public debarbly with us in its neglect and oblivion, we, in our turn, have indeed burdened the earth with things unspeakable.

If the Press and the public (who lead each other intermittently by the nose, and call the process mutual influence and education) are so wantonly ignorant and indifferent to all matters architectural; if a second-rate water colourist who has an exhibition in Bond-street, is lavished upon him columns of valuable criticism of pictures that will shortly disappear for ever into the limbo of private collections, while the foremost sites in London may be filled with inferior or unworthy by our greatest or our least, and not a glance, not a word, is vouchsafed by this cultured public of ours, or by the organs by which it is so fitly represented, matters so trifling as mere bricks and stones—still I hold that upon ourselves lies the greatest burden of blame; this great unseeing public, this dense, dim-sighted Press is to be taught only by object lessons, and these are too often lacking. When our works are as our aspiration, and our streets the ideal dwellings of dignity and grace, then perhaps the denizen of our cities may give his passing "oh" of admiration to other than the vulgarst of erections, and we may hear through the Press of something more than the gracious manner of the Royal Highness who opens the building "of early thirteenth century Renaissance, exhibiting signs of Chinese influence," and of the notable industry of Mr. Snook, the clerk of the works, and Mr. Spoon the builder.

When the finest site in Oxford-street, such as has not been in the market for many a year, is filled by a building in which are all the faults of omission and commission, and the public snub and approval and pass serenely by; when the Press silent, or (if approached) applauds—then we may only conclude that through our own shortcomings we suffer. Let us show our public what good architecture is; let each do his part, however small that part; seek out the principles underlying the greatness of the great architecture of the past and of our own day. This especially, as with discrimination, appreciative and critical Study our own time, its need and its achievement observe its excellence, and we need not spare its faults, and then when the crucial test of the happy moment of designing comes, our houses will no more be as "the houses in between," but a part of the City Beautiful which it lies with to bring into being. True enough, we may not all be inspired—not to each is given the golden

of genius—but, unless we can each be an artist in heart and aim—one who loves the work of creation, and to whom the cause of beauty is not the worst, one who will give to it the work of a lifetime nor grudge an ungrudging drudgery uncoupled with large payment; unless we can each be such a man as such an artist we had best turn back and rely ourselves to trading for architects we can hope to be. But when we build better, will the public also see better, then will the public Press grow in architectural intelligence to the level of our best representative journal, than which no craft or profession can be more learned or more disinterested representative and organ.

In our self-education there occur opportunities which I cannot but think we are too prone to abuse or waste, viz., the important aid that such as the Association or the Institute might offer by general and genuine mutual criticism work done, to be done, or in the doing. We public servants, and must not forget the fact, should be able to bear both from an educated critic and from each other generous and wholesome expression of critical opinion concerning productions—not, of course, the blind friendship or the unreasoning opposition of a politician, but that criticism which can only be generous, courteous, and just when arising between members of societies, existing for the furtherance of our art and of that which is attained by discrimination alone. Have indeed known cases where a clique have been upon and rent asunder the works of a man of unusual eminence, whose works stood the same relation to those of his detractors as does Somerset House to its neighbours already said. This is not the criticism we need—as for the cause of architecture as for the education of the critics—but a wholesome school of genuine criticism, where we might unpack honest doubts and justify our new departures, and giving simultaneously the best of our craft. The questions come, of course—“Who is to sit in judgment?” “What taste?” “What is style?” “What is it?”

The answers equally, of course—that shall all sit in the judgment-seat when we have climbed the high places of wisdom; that is no matter of whim, but the upshot of knowledge and insight; that “style is” in the words of Mr. Street, “the perfect harmony between the means and the end” and as to matters artistic, that is not touched by habit, and fears no discussion. It is the one constant fact that spells art and means beauty, says to each of us, in the words of Butterfield, “I am not arguing with you; I am arguing you.”

We must criticise ourselves and each other that public in its turn may acquire the knowledge to do so, and the Press the desire to understand, that happy time no building of importance will rise up without receiving its due of general be of analysis, and architecture shall again be crowned in the highest places of honour. Until time come our 1,200 has not justified itself.

The time is not yet, indeed; even the small audience we can command has gone astray to strange gods. They desire not quiet beauty, simplicity, and proportion, but what they are pleased to call “the picturesque”—a sad misuse of a desirable term that makes our wholesale condemnation the harder to express. For what is desired is a spurious, wilful inversion of order and unity, a subordination of proportion to the usual and the unexpected, the novel. This quality of the picturesque, so full of charm in its natural development, as a delightful, though occasional, incident to the architecture of the past, has been forced into the position of the leading ideal in the architecture of the present. Our public it is now enthroned as a chief glory indeed, as the one thing needful. We are asked for a profusion of cheap ornament and a nest of irrelevant gables—a “Gothic” porch and an Early English angle-nook, half-timbered, crested ridges and paltry finials of terraces or iron, all to be strung together in an impossible whole of disorder and ignorance; and, forsooth, is “Gothic,” this is “the picturesque.”

What can we do for the generation which has set alone wrought and loved such things, but which has stolen from us and annexed for its own use these words that have meant for us some of our fairest ideals? Hence comes it that every man who has learnt their alphabet of architecture by the light of the glories of the past, who have studied every stone and joint and

moulding of the old work in their care, who hold beauty and the quality which makes for beauty as the dearest and best article of their creed, these very men dare not call themselves “Gothic” lest they should bring upon themselves the reproach of cheap wedding-cake ornament and the shabby-genteel revivalism of ignorance, and would be ready to blush for shame should they be accused of a “picturesque” building. Examples both of the real and spurious are many. To find one where they are well contrasted, we need only look from beneath the trees of Battersea Park to what has been one of the finest reaches of our river, that between the Albert and Chelsea Suspension Bridges. I knew of no finer bit of grouping and outline than the quite exceptional terraces, the charm of which we chiefly owe to two men of genius—Mr. Norman Shaw and the late Mr. E. W. Godwin—with their surroundings of tree and river, and beyond Wren’s noble Chelsea Hospital. Here was the genuine picturesque, not aimed at in the individual works, but developed in their total effect.

But the plot of land between the terraces and the hospital has lately come into the market, and a long block of (no doubt) “commodious residences replete with all modern improvements” has sprung up, to the final destruction of the exceptional beauty of the spot. We are compelled to suppose that these buildings aim at the picturesque. They are planted upon the ground like an ill-drawn parabola—the two ends straightened with a connecting curve—no part of it having the slightest relation to the lines of hospital, river, or terraces. Bay-windows, balconies, the inevitable angle-turret, alternate gables with capricious differences of outline, some of them mere shams of elevated brickwork, iron-stayed, a gratuitously broken line of roof, all make up a composition, the like of which may be studied as an example of the power of bricks and mortar to mar a great opportunity and a great site. Chelsea Hospital may have even the better part in the view of the neglected back scornfully turned in that direction. No oriel windows and angle-turrets could be spared for a mere back—to be “picturesque” in front makes all other considerations superfluous, it seems. We have not all such opportunities of slighting our betters as this new block has achieved, yet it may remind us that the backs of our buildings often deserve quite as much study in their degree as do their fronts, for they often become important frontages, apparently unexpectedly to their designers; the back of one of our vast hotels, as seen from Whitehall, is a case in point. Let us simplify our fronts and not overlook our backs. An instance of a well-treated and considered back may be found in a small new building overshadowed by the School Board Offices on the Temple Embankment.

One burning subject remains for our consideration, that of competitions, upon which my predecessor spoke to you last year with special authority and point. He treated the question mainly from the view of the young competitor. May I add a word from the standpoint of architects generally and of assessors in particular. The Institute has again organised a Competition Committee, which it is hoped may exercise a speedy and beneficial influence upon the conduct of competitions. There has been certainly improvement in the last few years, but cases of gross injustice are still too frequently recorded; nor is it apparent to me how any protest, either from ourselves or our representative body, can avail much. We must act, not protest; and we have the matter in our own hands if we will act together. If no reputable architect will become a competitor unless there is first appointed a professional assessor, whose award shall be final; if no reputable architect will become an assessor unless his award is to be so accepted, the matter will cure itself. I know the plausible argument that he who pays the piper has a right to call the tune, but no self-respecting piper will submit himself to the verdict of an ignorant Sassenach who knows not the pipes or the skill of their master; when our public has trained itself to distinguish “The Bonnie House o’ Airlie” from “The most distressful country that ever yet was seen,” we may be justified in submitting ourselves and our harmonies to a knowledge even so rudimentary. The discovery of any touting on the part of competitors should be at once sufficient ground for the elimination of their names from the rolls of any honourable society. Especially to assessors we might commend the firm attitude suggested, for there is no doubt that a sure and honourable basis for the distinction of true merit by an adequately trained judge would be a real benefit, as much to the public as to the architects themselves.

The Building Act for London, to which this Association naturally look with great interest, seems, on the whole, to be working smoothly, but it is evident that an amending Act, to crystallise it, and set forth the true intention of many of its provisions, will soon be necessary. Many useless disabilities that hampered the progress of architecture under the old Act, have doubtless been removed, and in many respects we now enjoy opportunities for a better class of architecture than was tolerated by the Act of 1855. It should now be our object to induce surrounding local bodies to amend their by-laws in accordance with the better provisions of the new Central Act, as it is obviously bordering on the absurd that what may be legally done in London is still forbidden in Croydon and Willesden, merely because outlying Local Boards are too obtuse to alter or too proud to revise their own bantling by-laws.

To touch upon many points in the brief scope of an address is impossible. I have only laid before you to-night, Gentlemen, a few facts, a few theories, and perhaps a few fads—the facts as necessary as they have, I fear, proved tedious; the theories perhaps both trite and stale; the fads certainly sincere and most honestly uttered. If you find anything helpful in my platitudes, I shall be content. We architects have a great inheritance, and we have a greater responsibility. This world of ours is a naturally beautiful world. Man has it in his power to add to its beauty and to his own dignity in the adding, or to deface it. Which course shall we take? Each of us hopes for the higher, each of us stumbles oftentimes into the lower road. Let each of us look to it that no temptation, no laziness, no greed of easy gain, and, may I add, no client turn us from the right path. This Association is *Alma Mater* to many of you, and will be as the years go by to an ever-increasing number. As well as the earth on which we build, we dishonour her by any but our noblest efforts; if we give of our best, we are still but debtors.

“My new cut ashlar takes the light

Where crimson-blank the windows flare

By my own work before the night—

Great Overseer I make my prayer.

“If there be good in that I wrought,

Thy hand compelled it, Master, Thine—

Where I have failed to take Thy thought

I know, through Thee, the blame is mine.”

Professor Kerr, in rising to propose a vote of thanks to Mr. Caröe, said he had always felt it to be a great pleasure to attend the opening meetings of this Association, which he had done at intervals for about forty-seven years. There was something peculiarly appropriate in the circumstance of the opening of the annual session of architectural work taking place in connexion with this Association. The freshness with which happy subjects were combined in their studies, and treated by comparatively young men in the presence of still younger men, was a very great consideration, and to everyone it would be agreed that they had been favoured with an address characterised by all the excellence due to a cultivated mind and a gracious manner. He would venture to make a few remarks upon the great question of the educational development of the purpose of this Association. The assertion was perfectly true in every sense that the classes organised by the Architectural Association for the study of architecture were practically the best means for devising the real instruction of the young architect. They had, of course, to compete with other agencies more widely supported, but there was a purely practical and serviceable character about the way in which education had always been treated by the Association which could not be disputed. It seemed to him there were three objects with which the classes of the Association were concerned. In the first place, there was the preparation of young men for obtaining the degree of an Associate of the Royal Institute. He was not one of those who attached the greatest possible importance to examinations and diplomas. His mind happened to be defective in that respect, but he did think, speaking most seriously, and in the presence of young men who he hoped would bear in mind what he was saying, that the examinations of the Institute served a purpose which was absolutely indispensable nowadays. Although there were, no doubt, a certain proportion of the young men who, without being intellectually deficient, were not mentally fitted for the work of preparing for and passing examinations, and although some other provision should be made for their recognition, yet the great bulk of the students must

be largely benefited by a course of study which became compulsory, and with a degree at the end of it. He therefore hoped that nothing would be done on either side which should in the slightest degree weaken the connexion between the Association and the Institute. He believed, he would say, as an observant person, and as an old member of the Institute, that there was no member of that body who did not wish well to the Association, and to see it prosper in respect of its educational purposes to an extreme degree. Therefore, if there were any feeling or suspicion of what might be termed jealousy, for want of a better phrase, between the two Societies, let them dismiss it from their minds at once and for ever! The Institute was most kindly disposed towards the Association, and nothing that could be reasonably asked would be refused. The second purpose which the scheme of education of the Association answered was that it prepared young men for the practical work of their architectural business as distinguished from every other consideration. The English people consented to employ a great many architects. For what purpose? Not for high art, for they did not care nearly enough about it, though, at the same time, they would take a little if it were good. But what they wanted the young architects to learn to do was to transact their business of building safely, systematically, economically, and gracefully. The English people might not understand much about it, but what little they did understand they must have fairly considered. That, therefore, was the object of architectural practice, and if one looked at the curriculum laid down by the Committee of the Association, they would find that it had that purpose in view. He would earnestly advise the young men to look at the curriculum of the Association in that light and to join its classes. The third purpose which the educational system attempted to follow out was this, the establishment, to a greater degree, of the principles of artistic grace in buildings. There was a great deal to be done in that direction, but Providence must be given time. Evolution was slow, and they had a long way to go before they became thoroughly sound artistic architects. In order to make a beginning they should join this course of study. They would gain experience in their employer's office, but he did not undertake to teach what the Association did. Bearing these three considerations in mind, he stood as a sincere advocate for supporting the educational scheme of the Association, for no young man who joined its classes would ever regret having done so.

Mr. H. O. Cresswell said that it gave him the greatest pleasure to second the vote of thanks to Mr. Caroe. On such an occasion one was not expected to say anything by way of criticism, but there were one or two points in the new curriculum which he had studied with the greatest possible interest. He, therefore, took the first opportunity of speaking on the subject, because he had had something to do with the re-arrangement of the educational scheme of the Association, when it was altered a few years ago. He would like to say at once that, although in favour of the scheme then introduced, he had not pinned his faith to any particular curriculum, and he thought the Committee were perfectly competent to know what was best for the interests of the Association at the present time. He had, therefore, read their manifesto, in the shape of the new Brown Book with very great interest, for he believed that what they had done was in the best interests of the Association. The institution to a certain extent of the old voluntary system, he believed, would have very advantageous effects, because he did not think it was ever intended that system should be entirely dropped. He did not believe it was ever the intention of the framers of the recent scheme to entirely do away with what had been one of the great successes of the Association, viz., the assistance which the young men derived from the criticism of their fellows, or of those who perhaps were a little bit their seniors. He had also been interested, and perhaps from a selfish point of view, in listening to the words of the President, when he spoke of the examinations at the Institute, and the memorialists. He had had to skate over the rather fine and slippery ice of that much-vexed question, at a time when the excitement of the members did not allow them to look at it in quite the dispassionate way they were able to do now. He would congratulate the President on the charming way in which he had dealt with the subject, which they were now all able to regard in a much more impartial way than they were some few years ago.

The vote of thanks was then put, and carried by acclamation.

The Chairman returned thanks for the kind manner in which his somewhat lengthy remarks had been received. He hoped that Professor Kerr's remarks would be specially taken to heart.

The proceedings then terminated.

Illustrations.

SUNDIAL, WHATTON HOUSE.

THIS Sundial was designed to fit an ideal site in the beautiful grounds of Lord Crawshaw, near Loughborough. It is executed in Portland stone, and the four figures supporting the dial represent the Muses, Clio, Euterpe, Erato, and Urania.

The design is by Messrs. Brewill & Bailly, and the drawing was exhibited at the last Royal Academy.

THE CHURCH OF ST. WOLFGANG, ROTHEBURG-OB-DE-STAUBER.

THIS church lies on the extreme north-east of the town of Rothenburg, outside the Klengen Thor, and, in fact, forms part of the outer fortifications of the town. It was founded in the year 1473, and consecrated in 1483. It consists of a nave of three bays and a choir, both vaulted, and it retains still its wooden gallery and pulpit of the sixteenth and seventeenth centuries. The centre altar* is dedicated to St. Wolfgang, and the two side altars to St. Willibald and to the Virgin respectively. Immediately on the left of the entrance is the staircase leading to the watch-tower dwelling, built on the entrance gateway, which suggests that the priest of the church had to keep a look-out, not only on his own church, but on the approaches to the town. Between the two doors giving access to the church is a niche with a well-preserved statue of St. Wolfgang, and above a representation of the Crucifixion. The church is built in the warm-coloured limestone of the district, and on all sides forms one of the picturesque features of this ancient town, which has preserved its Medieval aspect to a far greater extent than any other I am acquainted with, even including Nuremberg and Carcassonne.

R. PHÉNÉ SPIERS.

THE HOTEL CECIL, LONDON.

THE Hotel Cecil, which is one of the largest buildings erected in London by private enterprise, is now so nearly completed as to have determined its owners at once to furnish and open it; and as no description of the building has yet been published, an account of it, with some illustrations supplied to us by the architects, may be of interest to our readers.

The site which the building occupies will be remembered by most Londoners as that of Cecil and Salisbury streets, which ended abruptly to the south in lofty iron railings overlooking the river. The houses, erected for private residences of a good class of people, had become reduced to a poor and dilapidated state, and were recently mostly occupied by second-rate lodging-house keepers. The whole area of these streets once formed the gardens of the house built by Sir Robert Cecil, principal secretary to Queen Elizabeth, and until it was recently acquired by its present owners, remained the property of his descendant, the Marquis of Salisbury.† The Ivy Bridge-lane, which forms its south-western boundary, was one of such importance, that it formed a sub-way beneath the Strand to enable the folk about the Covent Gardens and Maiden-lane to reach the river without risking their lives in crossing so busy a thoroughfare. Many there may be still who remember it as the principal way down to the "halfpenny boats," which used to ply between London Bridge and the landing-stage of the quaint old "Fox-under-the-Hill" at the bottom of the lane, until its wharves and mud were buried beneath the Thames Embankment.

* Offrichly-carved Late Gothic work, and attributed to Zeitblom, of Ulm.

† "The next was sometime the Bishop of Carlisle's inn, which now belongeth to the Earl of Bedford, and is called Russell or Bedford House. It stretcheth from the hospital of Savoy, west to Ivie Bridge, where Sir Robert Cecil, principal secretary to Her Majesty, hath lately raised a large and stately house of brick and timber, as also levelled and paved the highway near adjoining, to the sengers. . . . Ivie Bridge, in the high street, which had a way under it leading down to the Thames, the like as sometime had the Strand Bridge, is now taken down, but the lane remaineth as afore, or better, and parteth the liberty of the Duchy and the City of Westminster on that south side."—Stow's Survey of London in 1598.

After the Embankment had been formed while the property was falling into decay, the extent of getting "dangerous structures scattered about, many schemes were pondered for dealing with the estate, of which most prominent was that of a curved road from the Embankment level and connecting with the Strand by Waterloo Bridge. A scheme, which in spite of the rather gradients, would have been of considerable utility, particularly in conjunction with the Strand-Holborn street, would practically have run the estate and been unprofitable as a private enterprise. At the same time that this scheme was under discussion, Messrs. Perry & Reed, architects of the Hotel Cecil, prepared an amicable scheme which dealt with the estate as a self-contained property, with unique advantages of location and surroundings, and they opened negotiations with Lord Salisbury's solicitors on the basis of the ultimate result that, after many discussions, the whole freehold was purchased from Lord Salisbury by the promoters, who instructed architects to carry out their original scheme, this, with but slight internal modifications now been done in its entirety.

The peculiarities of the site enabled it to be dealt with in a manner and with advantages almost impossible in any other part of London, and it was singularly free from the dangers of "light and air" rights. Down the whole length of one side arrangements had been made to allow the buildings on the site to be erected any height without interference, whilst on the other side, and down the whole length of the other side the freehold belonged to a friendly neighbour who consented to an agreement for the mutual benefit of the estates: and on the south-west open gardens of the Embankment; and, although the blow-holes of the District Railway vied with them, fall, perhaps, within the angle of 45 deg., no solicitor calling them "skyline" threatened to apply for an injunction. By these favourable circumstances, the fall of ground levels from the Strand to the river presented very great advantages.

At the north end of the site the Strand is above the Embankment level, and a plateau, therefore, been constructed of vaults rising to height, carrying the courtyard which gives access to the buildings from the Strand level, and other roads beneath joining the low-level embankment road permit of all heavy traffic reaching the hotel out of sight and sound.

The area already covered with buildings, about 2½ acres, which has been laid out in distinct blocks of buildings, connected at various points by corridors and bridges, and surrounds a courtyard 300 ft. long by 80 ft. wide, between which the blocks are connected as one building. The blocks are of various sizes, which was some extent unavoidable, as they had to be planned with reference to the falling in of 1 in 10 at various dates. The southern block, which by far the loftiest, contains all the principal rooms, the chief kitchen and offices for management and the best suites of rooms. The western block, which is the smallest, contains the smaller dining-rooms and bachelors' quarters and the eastern block, about the same area as the southern, has larger family suites of rooms arranged separately in pavilions, and has two great banquet halls, each with their receiving, retiring, and smoking-rooms, and planned that they can be used together for great function. These rooms can be approached from the courtyard without passing through the hotel, and as they may be occupied by large numbers of people at a time, special arrangements have been made by which inmates can pass directly on to the low-level roads and the Embankment, without incurring the inconvenience of the event of alarm. The northern block, which forms the façade towards the Strand, not yet built, although the freehold of part of the property has been already acquired, but this did not form part of the "Salisbury Estate," or part of the original scheme of erection of this is now awaiting the passing of a special Act, which, but for the early dissolution of the last Session, was expected this year; and when this is completed, and the four sides of the quadrangle formed, the building will cover more than three acres, and will be unrivalled for elegance and convenience, as a hotel, in Europe, if not in the world.

In the construction of these buildings, although there is nothing very novel, for the architect has been careful not to try experiments of anybody's patents, there have been a great many difficulties to overcome. The site, although

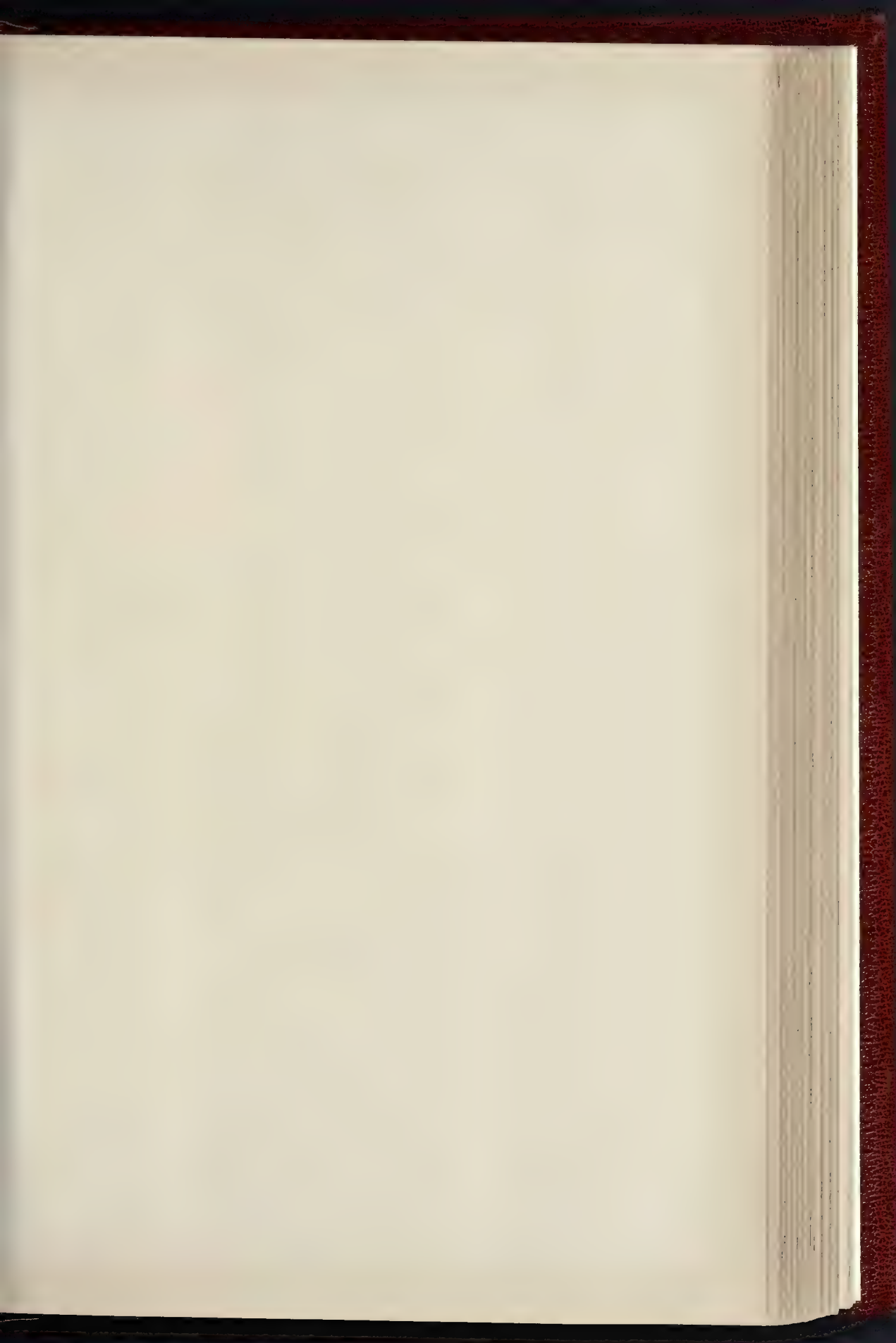


THE BUILDER, OCTOBER 19, 1895.

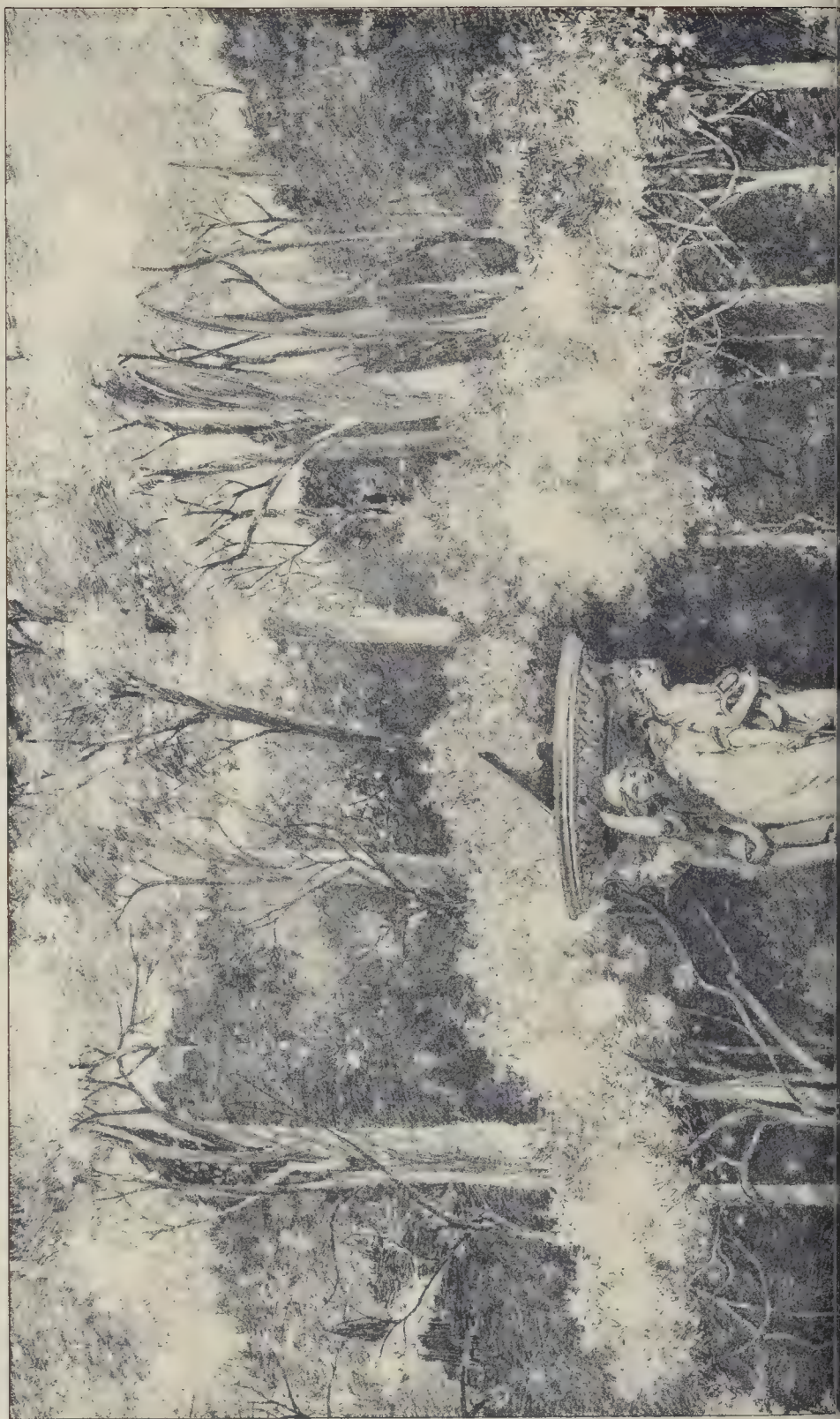


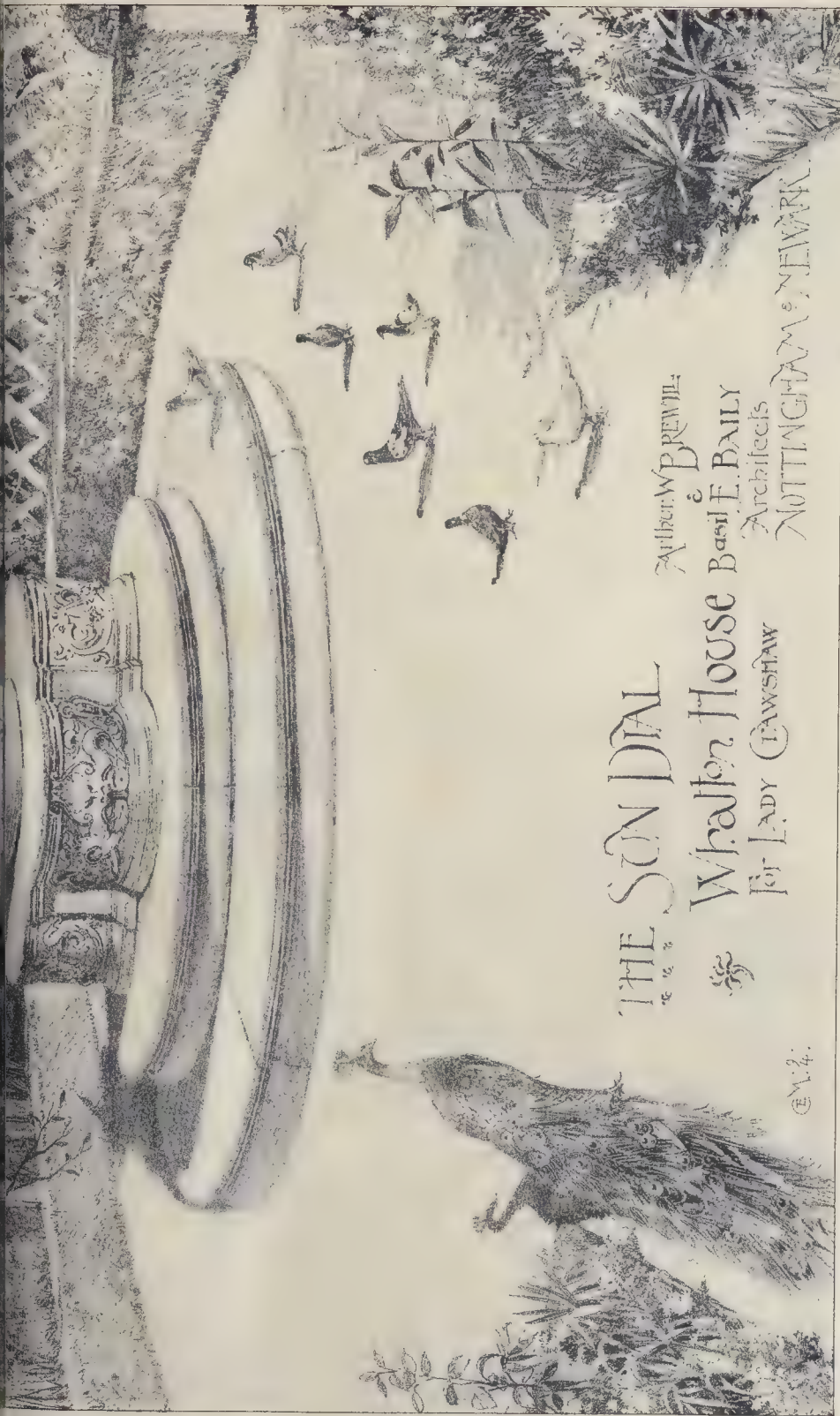


WOLFGANG'S KIRCHE, ROTHENBURG.—FROM A DRAWING BY MR. R. PHÉNÉ SPIERS, F.R.I.B.A.



THE BUILDER, OCTOBER 19, 1895.





THE SON DIAL

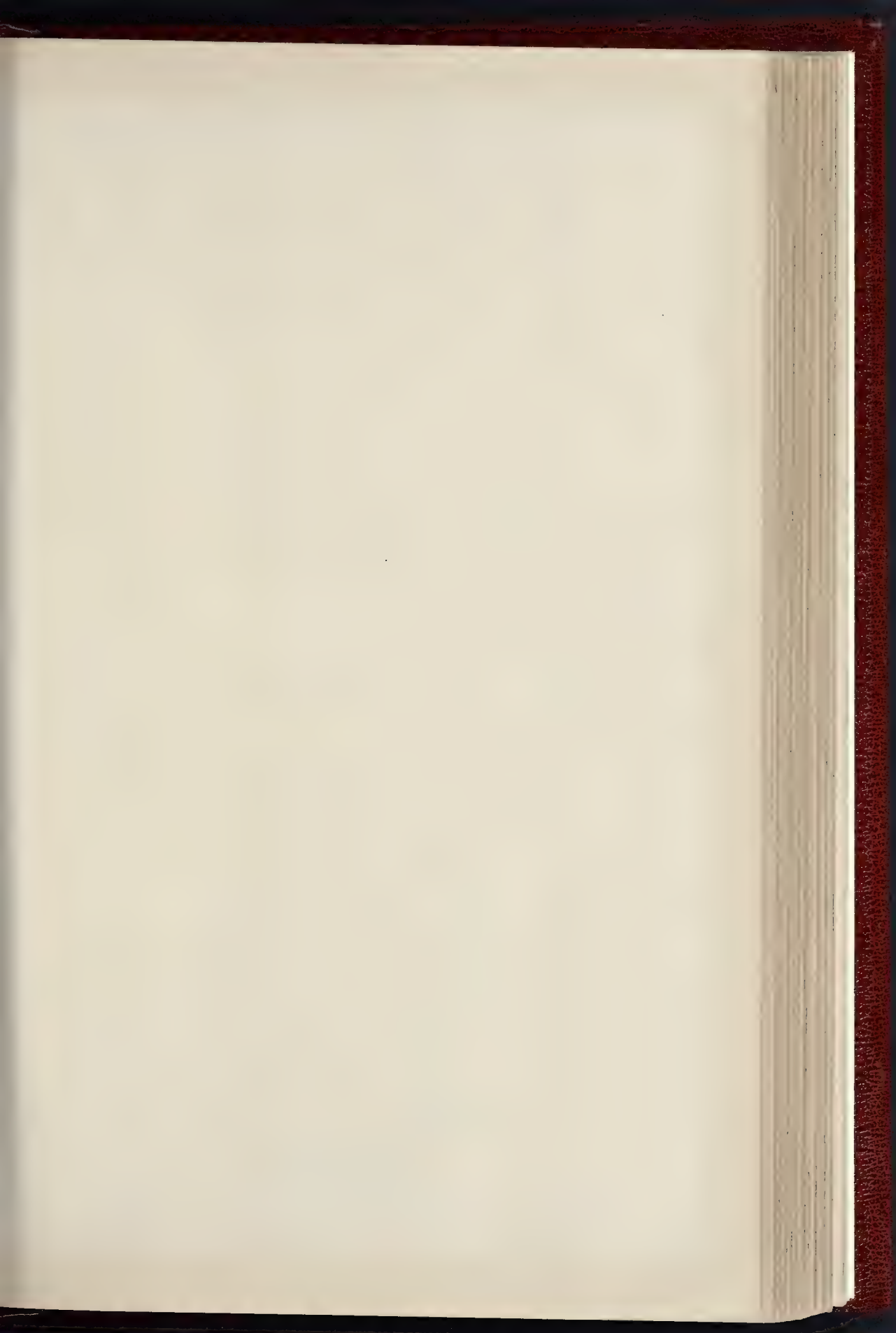
Whallor House
for Lady Crawshaw

Author: W. P. Brewin

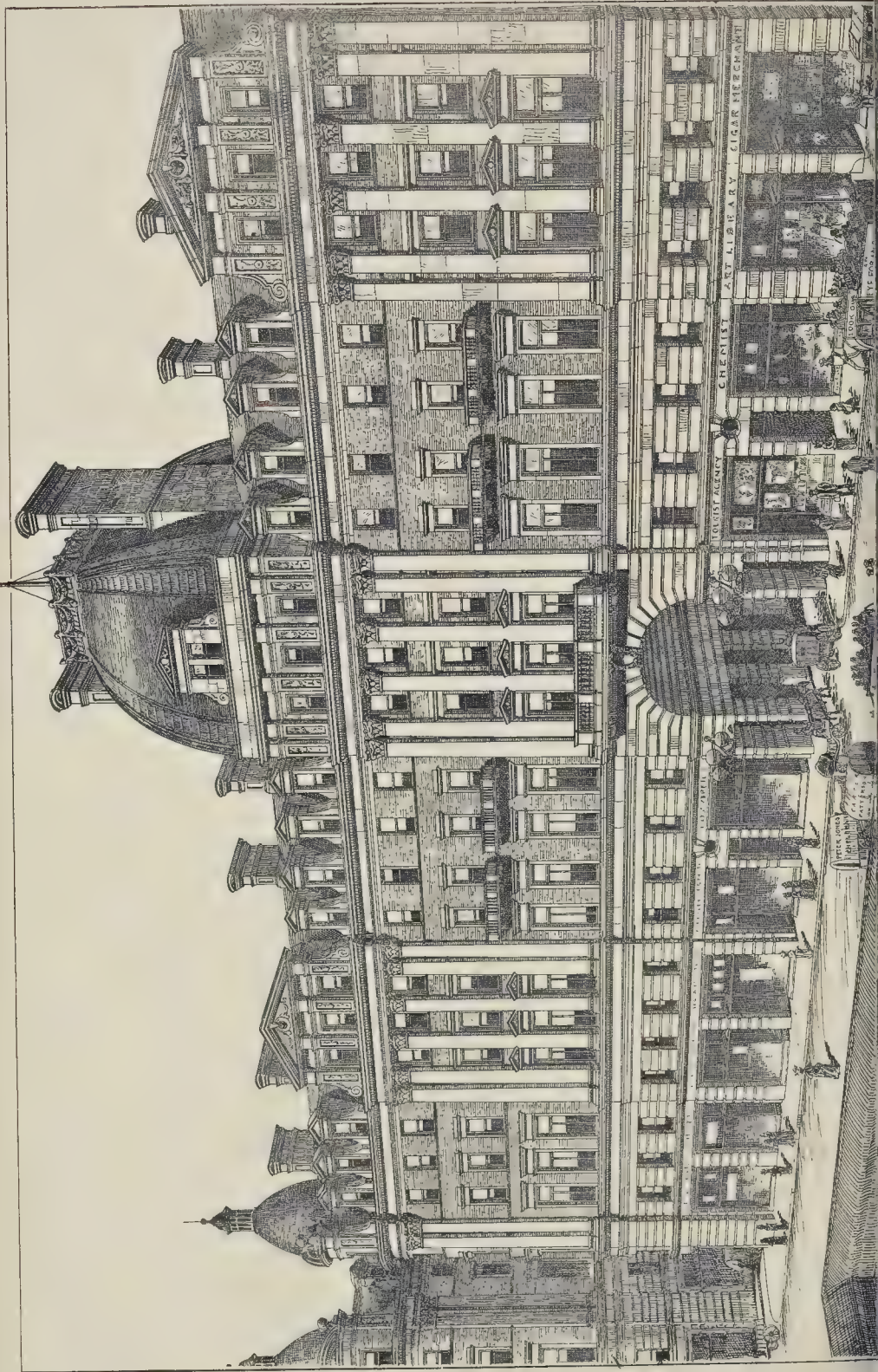
Architects:
Basil E. Baily

NOTTINGHAM & NEWARK

EN. 4.



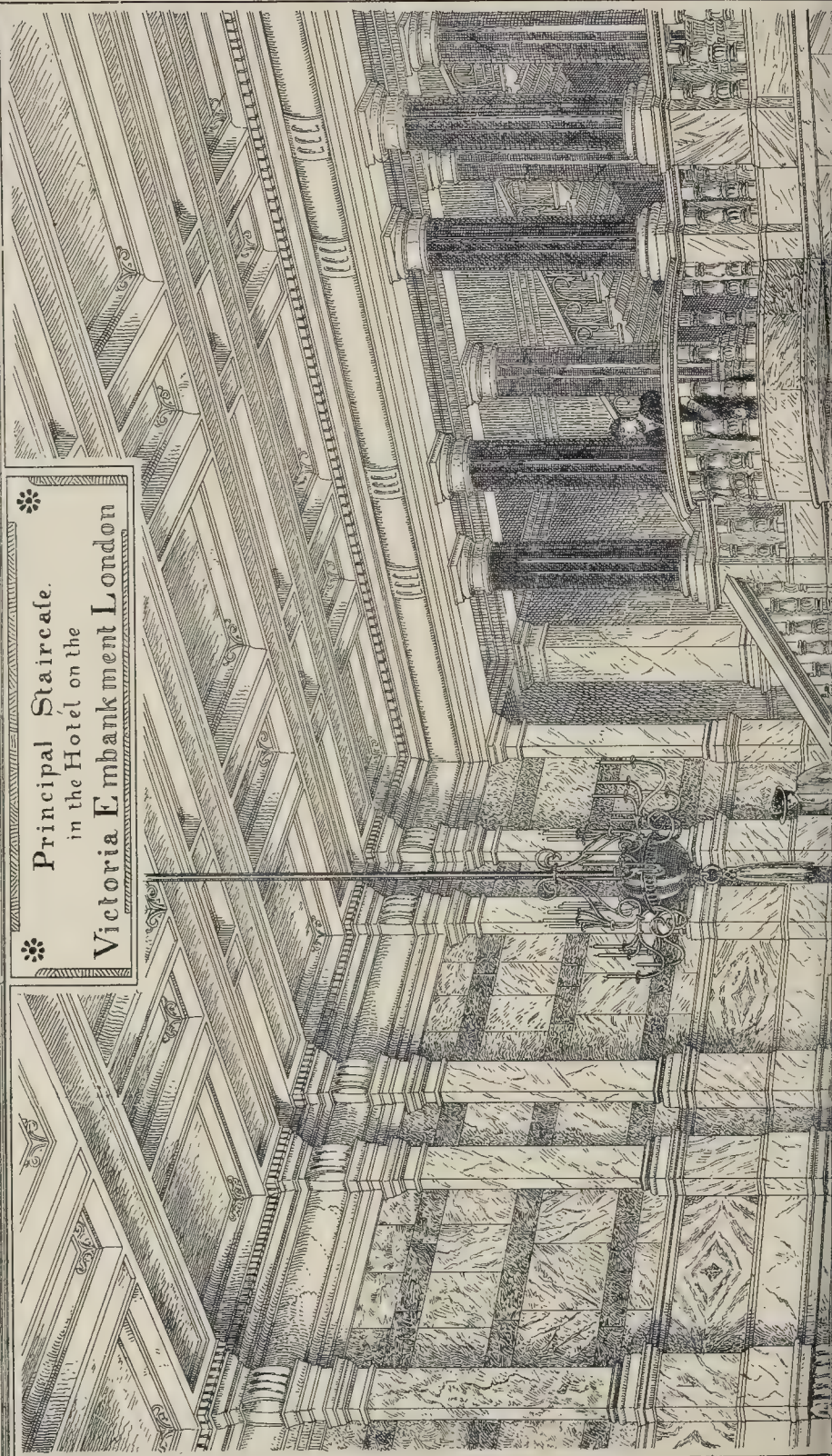
THE BUILDER. OCTOBER 19, 1895.

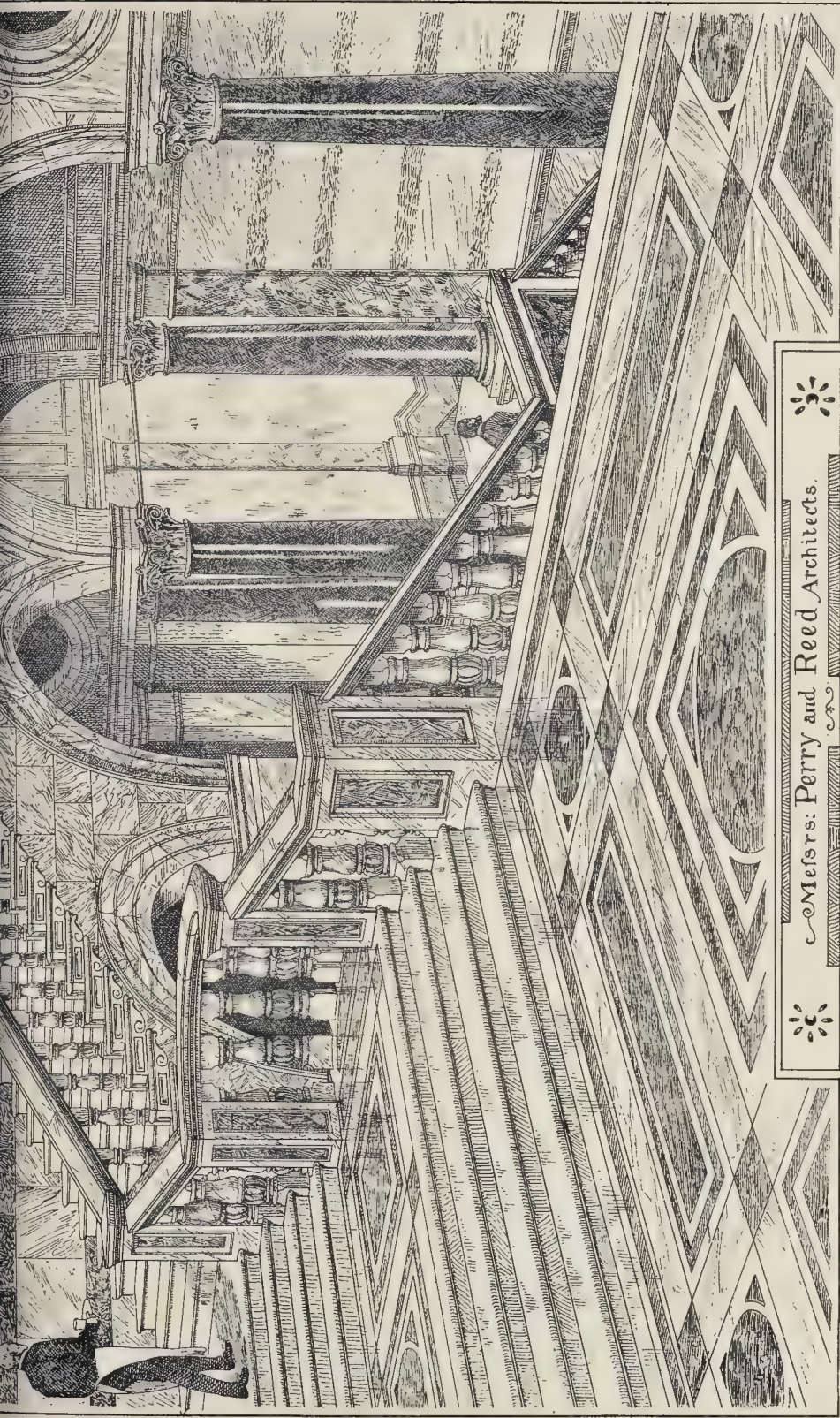




THE BUILDER, OCTOBER 19, 1895.

Principal Staircase.
in the Hotel on the
Victoria Embankment London





PHOTOGRAPH BY MR. J. H. B. EAST, 10, ABINGDON STREET, LONDON, W.C.

Messrs. Perry and Reed Architects.

HOTEL CECIL, VICTORIA EMBANKMENT VIEW OF GRAND STAIRCASE.

MESSRS. PERRY & REED, ARCHITECTS.



Wall Tiling in the Dining-rooms, Hotel Cecil.

er respects so satisfactory, was, for the founda-
tions, abominable. Running sand and running
water, with rotten houses standing around on the
is of your excavation, and their owners eager
see them plunge into the gulf, are difficulties
hitherto often have to contend with, and here
y abounded. In the case of the southern
ck, where the old buildings, which were
moved for it, had been built on the mudbanks,
was found necessary to sink the trenches to a
th of 35 ft., and these, to a width of 16 ft.,
were filled up with Portland cement concrete,
above all, over the whole site of the block, a
of cement-concrete 6 ft. thick was laid, and
r the rest of the estate one of 4 ft. thick.
A large amount of concrete has been used
throughout the buildings, as all the floors and
ay of the roofs are formed of 7-in. layers of
ment and breeze concrete (no one's patent), so
that the building is as fire-proof as any building
be, and the hydrants, which are liberally
ssured about, are only introduced to give a feeling
not otherwise necessary. Metal has
ered very largely into the construction of these
dings; and in all cases cast-iron has been used
columns and stanchions, and rolled steel for
joists and girders, and none has anywhere been
which has not passed the tests and received
certificate of Professor Kennedy. The isola-
of the several blocks made it possible to well
t and ventilate all the public large rooms from
sides, and not from glass roofs, and thus
ered it possible to build over them. But this
antage entailed the necessity, unless their
s were to be encumbered by many columns,
they should be crossed by heavy girders, and
the ends of these should be adequately sup-
ed. It, therefore, became necessary to adopt
rely metal mode of construction wherever the
r floors were planned to be great rooms, and
upper parts divided into smaller ones. Thus
greater portion of the southern block and the
le of the eastern have the superstructure
ed by girders and columns quite independent
the walls, which, indeed, could be removed
out affecting the upper part. The girders
ing the great halls are of steel plates built up,
of the south block weighing about 20 tons

each, and those of the east block about 28 tons
each, and their ends are laid loose in cast-iron wall-
boxes carried on cast-iron stanchion imbedded
in the brickwork of the walls. These stanchions,
again, rest on and are bolted down to wide-
spreading circular cast-iron bed-plates about 6 ft.
in diameter and strongly flanged, sunk their
whole depth into the concrete foundations. The
upper portion of the buildings over these girders
are carried on cast-iron columns, connected by
collars, forming one continuous column their full
height, carrying trimming joists of steel to receive
the smaller joists in the concrete floors. The
brick division walls between its various rooms
are thus independent of the walls above and
below, so that all the division-walls on a floor
can be removed without affecting the general
construction. The roofs of the eastern and
western blocks are entirely constructed of steel
joists and concrete; and the great domes of the
south block, 60 ft. square, have the angle-ribs
sheared out of steel plates strengthened by steel
angles.

Of the machinery and mechanical contrivances
scattered about some mention must be made.
An initial difficulty arose when it was discovered
that no water-supply to the top of so lofty a
building could be obtained, and this has been
overcome by building a series of large supply-
tanks in the basement, into which the water is
received, and whence, by automatic Worthington
steam-pumps, it is lifted to the top of the several
buildings as the upper tanks empty, and by their aid
also the water required for the hydraulic lifts
is re-used and not wasted. The passenger and
service lifts are too numerous to mention, but
they are all very powerful and rapid, being
hydraulic Otis lifts, worked under steam pressure
from steel cylinder tanks. For the general
heating, some of the cooking, and the working of
all machinery except the electric, steam is
generated in a series of boilers of the locomotive
type, fixed in the southern block. For the
electric lighting, plant is now being prepared, and
will be fixed in the vaults at the north end of the
estate, the shaft being carried up by Ivy Bridge-
lane.

To supply a hotel of this size, the question of

kitchen accommodation was a serious one, and
the extent of the site made it quite impossible to
have only one central kitchen; each block has,
therefore, been provided with one or more.
The most important one is that in the principal
basement of the south block, which is a lofty
room, with perfect daylight and ventilation,
looking on to the Embankment Gardens, and
surrounded with all the necessary subsidiary
rooms. For the eastern block, to serve the
great halls and the rest of the building, there is a
range of kitchens 250 ft. long; and, beneath the
roadway, by the principal entrance, and over
the lower road, a series of still, plate, and other
rooms is being constructed, with access directly
to each of the blocks.

The accommodation provided in the building is
very extensive, particularly in the large rooms for
public and exceptional uses. For residents there
are in the portion already built some 800 bed and
private rooms, without counting bath, dressing,
and such-like rooms. These are generally
arranged in suites of three to six or eight rooms,
each with its bath, lavatory, and w.c., and the
usual telephonic and other contrivances so dear to
the traveller.

Facing the principal entrance to the south
block is the great marble staircase to the main
upper floor, and to the floors below on the
garden front. To the right is the a la carte room,
56 ft. by 80 ft., and to the left, the reception and
drawing-rooms. In front of all these rooms is a
terrace, about to be enclosed as a verandah,
230 ft. long, to be used for dining and lounging,
whence a fine view of the Thames is gained,
from the Tower Bridge to Lambeth Palace, as
well as of the gardens below.

Descending the marble stairs from what is the
ground floor of the Strand level we reach the
principal floor of the garden front, which contains
the large table d'hôte room, 90 ft. by 56 ft., the
smoking and billiard rooms, and a smoking
lounge, 100 ft. long, overlooking the river. Below
this floor again, but level with the Embankment,
there is at the east end another large and lofty
public room with reception and other rooms
en suite, with a main entrance from the road in
front of the Savoy Hotel. At the west end are
the kitchens already mentioned.

The general style of the building has been
governed more or less by that of the neighbouring
Adelphi architecture; the scale is necessarily
greater; but in details of internal finishings, such
as joinery and plaster work, much of the style of
the Adelphi work has been reproduced. There is,
however, one important variation from this in the
treatment of the principal garden front, contain-
ing the table d'hôte and smoking-rooms. Here
the immense size of the rooms, with the com-
paratively low height of 17 ft., precluded the
adoption of anything like classic proportions, and
the architects, after much consideration, adopted
an exotic style. The whole of the moulded deco-
rations throughout have been adapted from the
details of the Emperor Akbar's palace at Futtipore
Sikri, the iron columns being encased in moulded
and glazed earthenware, of which also the
window canopies and chimneypieces are formed,
and the walls are covered with hand-painted tiles
with a soft broken glaze almost equal to ancient
Persian. The glazed earthenware is coloured in
large masses of bright colours, yellow, blue,
green, and red, which standing in relief against
the large areas of wall tiling in soft blues, pro-
duce, though some might not expect it, a very
harmonious effect. The ceilings are kept in very
low relief, with gilding on a cream-coloured
ground, and a small honeycomb cornice in bright
colours separate the plaster from the majolica.

There is a great deal of well-executed painted
decoration already finished, but the most im-
portant yet completed or in hand, except only
the Indian work, has been executed in marble.
Marble mosaic pavements are freely used every-
where, but the principal one is found in the main
entrance hall and vestibule, where the greater
part is executed in "opus Alexandrinum" in
choice marbles, as in so many Roman churches,
and other portions in the peculiar scallop orna-
ment found in the baths of Caracalla. The
staircase which leads up and down from the
entrance, a height of about 75 ft., is laid with
marble steps on concrete, the walls are revetted
with marble in courses, and all the balustrades
and every part showing is of marble. The
marbles here used were Sicilian, Castelpoggio,
Jaume Lamartine, Favonessa, &c.; and all the
columns and pilasters are monoliths. A similar
staircase, not so large, but perhaps more ornate,
and with Connemara marble introduced, is being
erected in the eastern block. The chimne-
pieces of the ground floor are all in marble,

and the columns supporting them are also monoliths.

The main building operations have been carried out by only two firms, Messrs. J. W. Hobbs & Co., who executed the southern block, and Messrs. Perry & Co., who have finished the western block and will shortly have completed the eastern one.

The following are the names of the firms who were employed on special departments of the work:—Boilers and engineering, Messrs. Slater; lifts and pressure-tanks, the Otis Elevator Company; heating, Messrs. Rosser & Russell; internal plumbing, Mr. Bone; ornamental plastering, Mr. Spencer; marble staircases, Messrs. Farmer & Brindley and Messrs. Wilkins; marble mantelpieces, Mr. Bingham; Opus Alexandrinum pavements, Messrs. Patteson; general mosaic pavements, Messrs. Diespeker; iron and steel work, Messrs. Handiside, Messrs. Lysaght, Messrs. M. T. Shaw, Cadogan Iron-works, &c.; painted decorations, Messrs. Cuthbertson; majolica and painted tiles, Messrs. Doulton; hydrants, Messrs. Stone; electric-wiring, telephones, &c., Messrs. Verity.

The whole of the works have been carried out under the superintendence of Mr. W. T. Winslade as clerk of the works.

Messrs. Perry & Reed have been the architects of the works from their commencement; all drawings, quantities, and full-sized details of construction and decoration have been prepared in their office by them or their own staff; and they have been fortunate to have had associated with them as professional experts Professor A. B. Kennedy, who has had to calculate for and supervise the whole of the metal-work, Messrs. R. Hammond and Morgan Williams, electricians, the former of whom has in hand the control of the electric plant, and the latter who superintends the general distribution of the electricity; and Mr. Henry Carter, who has had to deal with the difficult and important problem of the ventilation.

Our illustrations show by the plans of the Embankment and Strand levels the general arrangement of the rooms on those two floors, but the most important rooms of the southern block are intermediate to these. From the drawing of the proposed Strand front, which will be carried out next year unless the promoters fail to obtain their Act, it will be seen that the main entrance to the courtyard will be by a spacious archway in place of the present small roadways of Cecil and Salisbury-streets; and as it is provided by the Bill now before Parliament that the frontage line will be set back considerably, the scheme will become, when carried into effect, by the widening and embellishment of the Strand, a considerable public improvement.

THE SANITARY INSPECTORS' ASSOCIATION.

THE thirteenth annual meeting of this Association was held on Saturday last at Carpenters' Hall, London-wall, the meeting being presided over by Mr. H. Thomas. The first business was the admission of new members, fifty-nine out of sixty-three new applications being approved, besides the nominations as honorary members of Mr. W. H. B. Fletcher, Mayor of Worthing, and Mr. G. F. Baker, Mayor of Maidstone, which were accepted with acclamation. The Chairman then read the annual report. The principal topics referred to were the very successful conference held at Worthing in the summer, the visit to Paris, on the invitation of the French Society of Sanitary Engineers and Architects, various deputations to the Local Government Board and the London County Council, and the proposed new constitution of the Association. With regard to the last point, the report stated that the members of the branch associations of Yorkshire and Manchester, formerly affiliated to the central association, had accepted the principle of direct membership, that the Staffordshire and North-Western branches had the matter under consideration, but that the Liverpool Association still held aloof. In the interests of Sanitary Inspectors throughout the kingdom, the hope was expressed that the Liverpool, as well as the other associations, would still unite with the central body in forming a united and influential national association powerful enough to adequately protect the interests of all Sanitary Inspectors. The deputations to the Local Government Board were influentially supported and well received, but the change of Government had retarded the realisation of the benefits that might otherwise have been expected to result. The object of the interviews with the late President of the Local Govern-

ment Board was to obtain greater security of tenure of their offices for Sanitary Inspectors, a similar recognition by the authorities to that conferred on Medical Officers of Health, to obtain representation for the Association on the Examining Board of Sanitary Inspectors, and to obtain such alterations in the working of the Food and Drugs Act as would make it more workable. They asked that Sanitary Inspectors should be allowed to give evidence before the Select Committee of the House of Commons with a view to improvements in the administration of the Act. They had successfully opposed the action of the Hackney District Board which proposed to appoint six inspectors at totally inadequate salaries, the result having been that the Hackney Board had been obliged to raise its minimum from 91*l.* a year to 104*l.* They had also made representations to the London County Council with regard to a "combined drainage," with a view to obtain an alteration in the existing law, which was badly wanted in the interests of public health. Mr. H. Thomas was re-elected Chairman of the Council, the following being the remaining members elected:—Messrs. West, Alexander Fairchild, Greig, Wilson, Jacklin (Maidstone), Young, Watson, Pettitt, Ashdown, Munro, Lightfoot, Skinner, Carter, Chamberlain, Jones, Strutt, Jordan, and Edwards. A recommendation of the Council, to admit members without payment of entrance-fee, on application being made before the end of the year, was adopted, and the Council was called upon to consider the desirability of inviting the French Society of Hygiene and the French Sanitary Engineers and Architects to a conference in London during the ensuing year. A monthly journal had been successfully established during the year, with Mr. Tidman, the hon. secretary, as editor.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday, in the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

The Widening of Ludgate Hill.—The adjourned report of the Improvements Committee in regard to the widening of Ludgate Hill, which we printed in our last issue, page 256, was agreed to without discussion.

The Somers Town Insanitary Area.—The Public Health and Housing Committee recommended that the requisite resolution should be passed, under Section 4 of the Housing of the Working Classes Act, 1890, for dealing with the Churchway (Somers Town) area. As was explained in our last issue, the scheme deals with the houses in Churchway, Wellesley-street, Elizabeth-court, and York-buildings, and provides for the formation of a 40-ft. road along the existing line of Churchway, widening on its western side from Grafton-place to Drummond-street, and thereby converting three *cul-de-sacs* (Grafton-street, Wellesley-street, and Lancing-street) into thoroughfares. The estimated cost of acquiring the properties is 52,000*l.*, but it is anticipated that there will be a recompense amounting to 6,800*l.* Including paving works, the total net cost of the scheme is estimated at 51,650*l.* Lady Henry Somerset, however, the Committee reported, has agreed to defray all expenses in respect of her own property; and by this means the cost to the Council will be reduced to 39,150*l.* The number of persons to be displaced is 1,086, and accommodation for about 568 can be provided on the cleared site.

After some discussion, the recommendation of the Committee was agreed to.

The Strand Insanitary Area.—The adjourned report of the same Committee, recommending the adoption of a scheme under Section 4 of the Housing of the Working Classes Act, 1890, for dealing with the Strand insanitary area, was next considered. In our last issue will be found particulars of the scheme, which involves the clearance of (1) the area lying between Drury-lane, Stanhope-street, Blackmore-street, and Kemble-street; (2) the area lying between Clare-street, Clare Market, Houghton-street, and Stanhope-street; and (3) the area lying between White Hart-street, the Strand, Drury-lane, Drury-court, and Helmet-court. As has been pointed out, the total number of persons to be displaced is 3,938 (of whom it is proposed to rehouse 500 on the area and 1,269 on the Millbank Prison site), and the total net cost of the scheme is 216,500*l.*

The formal recommendations of the Committee were—

(a) That the requisite resolution under Section 4 of the Act should be passed, and the seal of the Council affixed thereto; and (b) that the solicitor be instructed to draw up a scheme on the lines of the report.

Colonel Ford, on (a), moved as an amendment:—

"That the Council, looking to the demands which will probably be made upon it next year, not so satisfied with the sufficiency of its resources as to feel justified in at present preparing a scheme for improving the area referred to."

Mr. Thornton seconded the amendment, which was defeated by a large majority.

Mr. C. H. Campbell then moved:—

"That the Council hopes that when drawing up the improvement scheme for the approval of the Council the Committee will consider the propriety of finding accommodation within the area in question for a larger number of displaced persons than that suggested in the present report."

Dr. Cooper seconded the amendment. In his opinion a great injustice would be done to the persons to be displaced, who were mainly engaged in the theatres and markets, if accommodation were not provided for them on the spot.

Mr. Beachcroft said that the Council's experience at Bethnal Green and elsewhere has shown that there could be no such thing as rehousing. The persons displaced from the slums would not go into model dwellings, but families from neighbouring tenements moved into the blocks.

Dr. Gooding said he could not understand how it was that the much-needed improvement had been so long deferred. The area was one of the most disgraceful scourges that London possessed.

After further discussion the amendment was rejected by a large majority, and recommendation a was adopted.

Mr. Bruce said he desired to substitute the following words for recommendation (b):—

"That the scheme submitted by the Committee for the improvement of the area referred to in the said resolution be approved and sealed, and that the Committee be authorised to complete the scheme and to take all necessary steps for depositing it and obtaining confirmation thereof."

The Rev. F. Williams desired to know whether the Council realised that if it passed the recommendation in its altered form there would be no further opportunity of revising the scheme.

The recommendation in its altered form was adopted, and the formal resolution to which it referred was carried.

Churchyard Bottom Wood.—The Parks Committee reported that the Hornsey Urban District Council had informed them that the Ecclesiastical Commissioners had intimated their willingness to sell to that Council the Churchyard Bottom Wood, Highgate, for the sum of 25,000*l.* The wood, which had an area of about fifty acres, was nearly on the boundary of the Hornsey district, and it was suggested that its acquisition for the purpose of a public pleasure-ground would benefit the surrounding districts even more than Hornsey. For that reason the District Council asked the Council to contribute a sum of 5,000*l.* towards the purchase-money. As, however, Hampstead Heath, Parliament Hill, and Waterlow Park were all within a short distance, and the wood was outside the County of London, the Council recommended:—

"That the Council do inform the Hornsey Urban District Council that it is not prepared to contribute towards the purchase of Churchyard Bottom Wood."

Mr. Idris moved to refer the recommendation back, contending that money could not be so usefully expended than in securing the wood.

The amendment having been seconded, it was agreed to by a large majority.

The Water Question.—The Parliamentary Committee reported that they had been considering what course should be adopted with reference to the Council's Water (Transfer) Bills, which had been suspended in July in view of the Parliamentary dissolution; and they recommended:—

"That, desiring that the supply of water in the Metropolis and the surrounding districts should be in the hands of a public authority, and with a view to a complete agreement with all parties concerned over the entire area supplied, the Council do inform H.M. Government either to deal with the question themselves or to appoint a Royal Commission to do so."

Col. Hughes, M.P., brought up the Report on behalf of the Committee, the Chairman of the body (Mr. McKinnon Wood) being in disagreement with the recommendation. He expressed his anxiety to see created a composite authority, representing all parties interested.

Mr. Stuart, M.P., moved the following amendment: "That the Bills for the purchase of the London water companies be proceeded with." He pointed out that the recommendation of the Committee involved a complete change of front on part of the Council. Had not Sir M. Whiteley's influential Committee already fully aired into the question, and was it not to Sir Whiteley, as Home Secretary, that the matter would have to go if the recommendation of the Committee were carried? That Committee had reported in general agreement with the proposal embodied in the Council's Bills, and gone so far as to say that the Council should be the water authority if so desired. He would the Moderates one simple question. Did the proposal to offer the companies better or worse terms than those offered in the Bills? Mr. McKinnon Wood seconded the amendment.

Mr. Onslow contended that no Conservative House of Commons would accept the Bills in the Bills which involved open arbitration, and which would necessitate an expenditure of sixty or seventy millions sterling. Then there the important question of who should be the water authority. The Progressive party thought Council should be that authority, but had it already enough to do? Was the Council really capable of doing the work now performed by water companies, assisted by at least one hundred clerks? It seemed to him that it must refer to a Royal Commission to decide who should be the water authority, and to consider the terms of arbitration and the question of an additional supply.

Mr. John Fulton thought it was quite unnecessary to ask for a Royal Commission, and he asked the Council that it had already spent £500, in connexion with the matter. He held that the Council was coming too near a solution of the water question to satisfy the water monopolists. There had been enough Royal Commissions on the subject in all conscience, and what was now wanted was an Act of Parliament.

Mr. Westcott said there was an agreement on the sides of the Chamber that the water supply at London be out of the hands of private companies and in the hands of a representative authority. There was no prospect of the present Bills passing in second reading, and he believed the Government would be quite prepared to deal with the question.

Mr. Farrer felt that, under present circumstances, if the Council proceeded with the Bills would have to pay an extravagant sum for the water, and would afterwards be compelled to face the additional expenditure, which the companies would otherwise have to face, necessary to establish a supplementary supply. In his opinion it would be futile to proceed with the Bills, and he was inclined to think that the best thing to do would be to go on with the litigation as to possibilities connected with a supplementary supply. He had not much faith in the reference to the Royal Commission, and it might be advisable to leave the matter in the hands of the Government.

Mr. Onslow said a show of hands there voted—For the amendment 50, against 48. On a division there was—For the amendment 53, against 54. On the motion of Dr. Collins the debate was adjourned.

APPOINTMENT OF AN ESTIMATING AND MEASURING SURVEYOR.

On the recommendation of the Works Committee Mr. A. S. W. King was elected to the vacant post of Estimating and Measuring Surveyor in the Works Department. The Council adjourned soon after seven o'clock.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—The galleries of the Royal Society of Artists, in the Strand, a conversation was held on the subject (by permission of the Committee) to inaugurate the twenty-second session of the Association. Mr. William Henman, the President, received about 150 guests at 8 o'clock, distributed the prizes to the successful students attending the various classes of the past year. Mr. E. F. Reynolds gained the first prize for an illustrated essay upon Mr. Bidlake's early lectures, and for the best set of sketches on Saturday afternoons and on the summer excursion to Ludlow and neighbourhood. Mr. E. A. McKewen was the second prize in the former, and Mr. A. E. McKewen in the latter competitions. For the best set of designs prepared in conjunction with Mr. Bidlake's class at the School of Art, Mr. James A. Swan secured the

first prize, and Mr. McKewen the second. Mr. W. J. Prichard was successful in the class for construction; and for the best set of sketches made at the evening class under Mr. E. C. Bewlay, Mr. McKewen was first and Mr. H. Norman second. An interesting collection of students' work and sketches, also drawings by London and Birmingham architects, were hung on screens in the small circular room.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The second annual conversation of this Society took place in the Cutlers' Hall on Wednesday last week, and was attended by upwards of 300 persons. The Sheffield artists again extended to the Society the privilege of using their exhibition rooms, and the guests were able to view the collection of paintings which have been brought together. There were also on view the students' work in the designing and sketching classes of the Society, and the books, drawings, pictures, and engravings which had been kindly lent. The President, Mr. C. Hadfield, delivered his inaugural address, part of which we printed last week, page 260. Subsequently the President distributed the students' prizes.

GLASGOW INSTITUTE OF ARCHITECTS.—The annual general meeting of members of the Glasgow Institute of Architects was held in the new rooms, 187, Pitt-street, on the 15th inst. Mr. T. L. Watson, President, in the chair. The Secretary (Mr. C. J. MacLean) read the twenty-seventh annual report of the Council on the affairs of the Institute. It stated that the past session had been one of great prosperity. There were now on the roll sixty ordinary and ten honorary members. The finances were in a very satisfactory position.

The Chairman, in moving the adoption of the report, said he had to congratulate the members upon their first meeting in these rooms, as well as upon an accession of new members during the past session, which made their numbers larger than at any previous period in the history of the Institute. The leading purpose for which the Institute had been constituted was, according to the articles of association, "The advancement of the art and science of architecture." A good deal was implied in these words. The advancement of architecture was, and must ever be, bound up in the advancement of the other arts and in the intellectual and social advancement of the country.

It was natural, therefore, that they should acknowledge and seek alliance with some of those who had contributed to this intellectual and social advancement, and with some of the most distinguished workers in their own and other arts. They had seen a wonderful revival in some of the arts connected with architecture—to quote a notable instance, the art of glass—painting or stained glass. There were other arts, less important it might be, but still valuable, which had become almost extinct within the last hundred years. He did not attempt to enumerate them, he mentioned only one or two. They had no workers in lead such as they had had in past times. Up till early in the present century the worker in lead was an artist, now he was a registered plumber. With all possible respect for registered plumbers, and the useful and excellent work they did, he suggested that an exhibition of old artistic lead work, if such could be got together, would be something of a revelation to lead-workers and to many others besides. Take, again, cast-iron, which was largely produced in the neighbourhood of Glasgow, would anyone assert that our ironfounders generally knew anything of cast-iron design? And so with other departments of work. He believed that small and carefully-selected exhibitions would have a highly educative influence both on architects and their collaborators in the work of construction and decoration. Many other departments of work would occur to each of them in which an exhibition of select examples, while not sufficiently interesting to attract the public, and while not intended to attract them, would for that very reason, it might be, prove more valuable to workers in the arts. They were sometimes asked why they did not emulate or excel the greatest works of other ages. It was a shallow reproach, and one that they might retort upon those who used it. Architecture was not merely the work of a few individual constructors and designers whom they called architects; more than any other art it was the expression of the life and habits, the character and genius, of a people. It was the history, and perhaps the only perfectly true history, of its own time. Did anyone suppose that the cathedrals and churches of the Middle Ages, the castles and palaces of the Renaissance, were merely the work of a few brilliant and accomplished architects? Did they not see in them a whole

people moved by a common impulse? Architecture at its best was always national as well as individual, and he did not believe that anything national could be produced otherwise than by a nation. A national art could not grow up in the midst of national indifference. There were not wanting signs of hope for the future, and they could only go on and do their utmost with the work at their hands.—Mr. W. Forrest Salmon seconded, and the report was adopted. The treasurer's statement was also submitted and approved, and members of the Council appointed. In the evening the members of the Institute inaugurated the occupancy of their new premises in Pitt-street by holding their annual dinner.

Mr. T. E. Watson occupied the chair. Dr. R. Rowand Anderson gave the "Glasgow Institute of Architects." On behalf of the Architectural Association of Edinburgh he wished them every success in their new house. The Chairman, in reply, remarked that it was a great satisfaction that the Institute had become residents of these premises, and he had no doubt that it would lead to developments in many directions. He was afraid that architects and kindred bodies were working under somewhat adverse conditions in these days. They had got into a great age of machinery, and developments in that direction had blinded a great many people to the claims of art and the attractions that art had to offer. They had learned to travel at the rate of 30 miles an hour, and perhaps they might learn yet to travel at the rate of 60, 70, or 100 miles an hour. There was a danger of the value of such achievements being over-estimated. He went on to allude to the various improvements that had been effected in these times towards the greater comfort and longer life of the people, and held that in that connexion architecture could perform an important function.

It was the function of architecture to make those lives enjoyable, to give people good houses, healthful houses, and to lead them to appreciate those attractions which architecture, sculpture, and the other arts were so well calculated to afford. The other arts were—"Merchants' House and Trades' House," "Painting and Sculpture," "The University," "Glasgow School of Art," "Kindred Societies," and "The Secretary."

THE GLASGOW ARCHITECTURAL ASSOCIATION.—On Saturday afternoon last the Glasgow Architectural Association opened their new rooms with a musical promenade and Arts and Crafts Exhibition. The President (Mr. A. N. Paterson, M.A.) welcomed the members and their friends to the rooms, and stated that while the Association was nearly twenty years old, through the impecuniosity of youth, it had not been able sooner to have accommodation worthy of its members or of the profession, but by combining in the sharing of premises with the older body, the Institute of Architects, that difficulty had now been overcome.—Thereafter the large company present were treated to a musical programme. The exhibition in the art section comprised water-colour sketches, measured drawings, &c., from Scotland, England, and the Continent, contributed by Messrs. Conyer, Craigie, Fulton, Gillespie, Greig, MacIntosh, McGibbon, Muirhead, Mitchell, Paterson, Stewart, Stoddart, Salmon, and Whitelaw, all members. The craft section comprised antique furniture, brass lamps, door-knockers, Chinese bronzes, vases, brasses, &c., by Mr. W. B. Paterson; leaded glass by Messrs. Stephen Adam, J. & W. Guthrie, and Paterson and Thomson; bronze panels, &c., Messrs. Kellock Brown, William Sheriffs, and A. M. F. Shannon; brass and copper work by Messrs. Buchans & MacIntyre, and McGeoch, Kemp & Co., and others. The rooms are conveniently situated in the city, and comprise on the ground floor a hall for meetings, &c., smoking-room and library, where the members may meet daily and discuss all matters relating to architecture, and in the basement the caretaker resides, from whom members can obtain light lunches daily. It is intended having all the latest information relating to contracts, competitions, and situations, and also regarding the latest books published on specific subjects.—A lecture was delivered in the Rooms on the 8th inst., by the Rev. David Watson, who took as his subject "Some recent features in the architecture of Scottish churches." Mr. A. N. Paterson, M.A., presided. After some remarks upon the inartistic character of the generality of Scottish churches, and the main causes which had induced that unfortunate condition of things, the lecturer made reference to the architectural revival which had begun in these days. He held that much more could be done by the church

jections, the Sub-Committee decided to make the following recommendations:—1. The first paragraph of Clause 5 is as follows:—“Where the condition of wages shall apply, the contractor shall pay to the workmen employed by him the rates of wages mutually agreed upon by the Central Association of Master Builders of London and the representatives of the Unions of the various branches of the Building Trade, and which agreed rates of wages are set out in the schedule hereto.” The Sub-Committee find that considerable misapprehension exists with regard to this clause, as some of the contractors appear to be of opinion that it prevents them from employing apprentices and improvers at less than the full rate of wages for workmen. The following is an extract from a report which was made to the Works Committee on March 11, 1889, by a Sub-Committee appointed to consider the question of the rates of wages, and which report was then approved by the Committee:—“With regard to the meaning of the term ‘improvers,’ the Sub-Committee have ascertained that there are two classes of workmen who are generally recognised as ‘improvers,’ namely: (a) indentured apprentices, and (b) inferior workmen, but there are also workmen who are paid less than the minimum because they are inferior servants, and have become infirm from injury or age. With regard to the percentage of ‘improvers’ in the total number of men employed, the Sub-Committee find that this percentage is variable, being greater in winter than in summer, owing to the fact that although the ‘improvers’ themselves are pretty constant in employment, the number of other workmen employed during the former season is usually considerably less than during the latter. The Sub-Committee understand, however, that except during the winter months, the number of ‘improvers’ employed may be taken generally as from 5 to 10 per cent. of the total number of workmen employed. The Sub-Committee think it would be desirable that the Works Committee should place on record the fact that they do not object to the employment of ‘improvers’ to the extent specified in the above extract, and have informed the contractors who were present that they have no doubt that this represents the opinion of the Works Committee at the present time. 2. The Sub-Committee recommend that Sub-section (b), Clause 6, be omitted from the form of contract for new schools and enlargements, and that, in future, instructions be issued by the architect to the clerk of works employed by the Board on each job, requiring him to display on the works a copy of the schedule of wages as printed in the form of contract. 3. The Sub-Committee find that considerable misapprehension has also arisen with regard to Sub-section (b), Clause 6, and they are of opinion that this Sub-section should be amended so as to make it clear that it will be sufficient for the purposes of the Board if the contractor is required to produce his weekly pay-sheets only on the direct instructions of the Board or its Committees, in the event of a dispute arising as to the rate of wages paid in any particular case. The following are the alterations which it is now proposed to make in Clause 6 of the Form of Contract for New Schools and Enlargements, in order to give effect to the recommendations of the Sub-Committee:— 6. The contractor shall at all times during the continuance of this contract perform, observe, and keep the following conditions:—(1.) The contractor shall, during the continuance of this contract [display and keep] *allow to be displayed* upon the site of the works and in every factory, workshop, or place occupied or used by the contractor in or about the execution of this contract [in a position in which the same may be easily read by all workmen employed by the contractor in or about the execution of this contract a printed or written copy of the said schedule hereto, and for each and every breach by the contractor of this condition, and notwithstanding the condonation of any prior or other breach, the contractor shall on demand pay to the Board as liquidated damages and not as a penalty the sum of *1*l.** for every day during which such breach shall be so continued. (2.) The contractor shall, to the satisfaction of the Board, provide and keep proper books *weekly pay-sheets* in which shall be correctly and promptly entered from time to time the names of all such workmen as aforesaid and the wages paid to such workmen respectively, and shall from time to time when required by the Board for the purpose of meeting any complaint by the workmen *clearly printed or written copy of the said schedule hereto, and for each and every breach by the contractor of this condition, and notwithstanding the condonation of any prior or other breach, the contractor shall on demand pay to the Board as liquidated damages, and not as a penalty, the sum of 1*l.*” The Committee now recommend that these alterations be approved, and that they be authorised to make similar alterations in the other*

forms of building contract. According to the Board’s agenda-paper, an amendment was moved at the meeting on Thursday to refer the resolution back to the Works Committee. THE NAVE OF CARLISLE CATHEDRAL.—Mr. Charles Ferguson has raised a rather interesting question, says the *Carlisle Express*, relating to the history of Carlisle Cathedral. The old histories and traditions tell us that the nave of the Cathedral originally consisted of nine bays, and extended nearly as far as Bishop Ware’s residence, and that, having been very much knocked about during the troublous times of its early existence, it was finally destroyed, or partially so, and reduced to its present dimensions during the Civil Wars. Mr. Ferguson doubts the whole story. He does not deny that the nave of the nine bays may have been contemplated, or even that the foundations were actually put in, but thinks it probable that either the original design was not carried out, or that the nave had been reduced long before the Reformation. He is led to this conclusion from his belief that the west wall is a pre-Reformation wall. There is a tradition that the stones of the old walls were used to build a guard-house. But if that is correct, where are those stones now? “The jambs, caps, pillars, and arches of the great doorways and windows,” he says, “would not altogether disappear if they once existed and were built into subsequent buildings.” In the meantime he seeks information, and appeals to the workmen who may have been engaged in erecting the modern window in the wall, and to persons having old drawings of the Cathedral, to help him to clear up the question.

LEGAL.

LIGHT AND AIR CASE:

THE ACTION AGAINST THE OXFORD MUSIC HALL COMPANY.

THE case of Hawkins v. the Oxford, Limited (reported in the last issue of the *Builder*), was in the list of hearings before Mr. Justice Hawkins, sitting as Vacation Judge, on Tuesday last, but by consent of all parties it was arranged that it should stand over till the second motion day in next sittings, the injunction granted by his Lordship to the plaintiffs on the 8th inst. being extended till then.

J. P. NORRINGTON v. J. MARSLAND.

At the Lambeth Police-court on the 10th inst., Mr. John Marsland, builder, of York-street, Walworth, appeared to answer a summons taken out by Mr. J. P. Norrington, Surveyor to the Lambeth Vestry, complaining that he unlawfully commenced to lay or dig out the foundation of a new building on certain land in Vauxhall-walk, without having first given seven days’ notice in writing to the Vestry.

Mr. H. J. Smith, Clerk to the Vestry, appeared in support of the summons, and Mr. Bassett Hopkins represented the defendant.

Mr. Smith said the Vestry instituted these proceedings under the 76th Section of the Metropolitan Local Management Act, under which all builders or persons intending to build new houses had to give seven days’ notice in writing to the Vestry or District Board before they commenced their operations. In July the attention of the Vestry was drawn to the fact that the erection of a building had been commenced in Vauxhall-walk, of which no notice had been given to the Vestry. The defendant could scarcely plead ignorance of the requirements of the Act, because, up to recently, he was a member of the County Council and the Vice-Chairman of the Committee which had the control of the buildings of the Metropolis.

Mr. Bassett Hopkins remarked that this was the first time, so far as he knew, that the actual builder had ever been proceeded against for neglecting to serve a notice under this section. He submitted that the words of the section did not apply to the builder any more than they applied to his workmen or the architect. The section obviously meant that the notice should be given by the person who gave the original direction—the principal—and not the one who had actually been understood throughout the Metropolis.

The Magistrate: Oh, no. This is not the first time within my experience, certainly, that a builder has been summoned under this section. What you have got to persuade me is that the words “By the person intending to build or rebuild” may not include the builder.

Mr. Bassett Hopkins contended that it was incumbent upon the prosecution to show that it was meant by the Legislature to include the builder.

The Magistrate replied that his experience was that the responsibility of giving notice, both under the Statute, and the Building Act, was always thrown upon the builder. He could not give effect to Mr. Bassett Hopkins’ contention, and the case must proceed.

After some evidence had been given by the Vestry’s officials, the Magistrate said a technical offence had been committed, and ordered the Defendant to pay a nominal penalty of 20s. and 2s. costs.

CAPITAL AND LABOUR.

STATE OF EMPLOYMENT IN SEPTEMBER.—According to the *Labour Gazette*, in most of the important industries the state of the labour market has continued to improve during September, and the percentage of unemployed in unions making returns is lower than at any period since 1891. The building trades continue busy in most districts, the percentage of unemployed members in unions making returns having fallen from 1·8 in August, to 1·6 in September, compared with 3·6 in September, 1894. On the whole, the furnishing and wood-working trades are well employed, and the percentage of unemployed union members has fallen from 2·7 in August, to 2·6 in September, compared with 4·7 in September, 1894. The number of fresh disputes occurring in September was 66, compared with 52 in August and 69 in September, 1894. Particulars obtained as to numbers affected show that in 60 disputes, 9,893 workpeople were concerned. Of the 12 disputes in the building trades, 2 were upon wages questions, 6 upon refusal to work with non-union and free labour men, 1 upon demarcation of work, and the remaining 3 upon various points of working arrangements.

ARBROATH MASTER BUILDERS’ ASSOCIATION.—At a meeting of the Arbroath Master Builders’ Association, held on the 9th inst., a deputation from Dundee attended, and strongly advised the masters to endeavour to get the master tradesmen in Arbroath to form a branch of the Scottish Building Trades’ Federation. The deputation explained the working of the Federation, and it was resolved to hold a meeting at an early date to deal with the proposal.

MEETINGS.

FRIDAY, OCTOBER 13.
*Sanitary Institute (Lectures for Sanitary Officers).—*Professor Bostock Hill on “Trade Nuisances.” 8 p.m.

SATURDAY, OCTOBER 19.
*Sanitary Institute (Lectures for Sanitary Officers).—*Inspection of Harrison & Barber’s Knacker Yard, Whitechapel. 3 p.m.
*Northern Architectural Association.—*Visit to Sunderland.

TUESDAY, OCTOBER 22.
*Sanitary Institute (Lectures for Sanitary Officers).—*Professor Confield on “Water Supply, Drinking Water, Pollution of Water.” 8 p.m.

WEDNESDAY, OCTOBER 23.
*Architectural Association (Discussion Section).—*Mr. Sydney Perks on “Professional Etiquette.” 7 p.m.
*Sanitary Institute (Lectures for Sanitary Officers).—*Inspection of the East London Soap Works, Bow. 3 p.m.
*Institution of Mechanical Engineers.—*Mr. H. K. J. Barstall on “The Electric Lighting of Edinburgh.” 7.30 p.m.

THURSDAY, OCTOBER 24.
Institution of Mechanical Engineers (continued).—(1) Report on the Lillie Experiments upon the efficiency of Ropes and Belts for the Transmission of Power; translated by Professor David S. Capper. (2) Observations on the Lillie Experiments upon the Efficiency of Ropes and Belts for the Transmission of Power; by Professor David S. Capper. 7.30.

FRIDAY, OCTOBER 25.
*Architectural Association.—*Annual Conversazione, King’s Hall, Holborn Restaurant. 8 p.m.
*Sanitary Institute (Lectures for Sanitary Officers).—*Dr. A. Hill on “Diseases of Animals in Relation to Meat-supply: Characteristics of Vegetables, Fish, &c., unfit for Food.” 8 p.m.

SATURDAY, OCTOBER 26.
*Sanitary Institute (Lectures for Sanitary Officers).—*Inspection of Richmond Main Sewerage, Mortlake.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

20,279.—WATER-CLOSETS: *E. Morton and another.*—This invention relates to the form of water-closets, known as valve-closets; the valve-box and overflow trap being cast in one piece. The metal dip or seal of the trap is also cast in connexion with the valve-box cover, which is formed to fit closely into the mouth of the trap.

20,356.—FLUSHING APPARATUS: *H. Kent.*—According to this patent an ordinary supply cistern is fitted with a syphon-tube having two arch-shaped bends which form a double syphon. One of the bends being higher than the other becomes charged with air, and stops the flow of water through the syphon. The flushing is started by causing this air to escape by a tube connected to the crown of the arch or other suitable means.

20,565.—JOINTING PIPES: *P. Brook.*—Relates to jointing stoneware or earthenware sewage-pipes and making the joints, at the time such pipes are laid, by means of cement being run into the space between socket and spigot, through holes in the socket, commonly called “grouthing holes.” Several of these holes are made, and the cement is run into the socket by means of a tube or funnel beginning at the lowermost hole, and thus forcing out the air, which would otherwise prevent the socket being properly filled.

21,447.—CHIMNEY SHAFTS: *J. Rae.*—For preventing down-draught and increasing up-draught in chimney shafts or ventilators. Four vertical division plates are arranged at right angles in the interior of a cylindrical shaft, and project a little way above the top. An inverted cone, having a diameter somewhat less than that of the shaft, is fixed in a position four or five inches below the vertical plates. The whole is surmounted by a conical or other top over the division plates.

23,473.—WATER-CLOSETS: *H. Baden.*—Relates to syphon closets in which the space between the two traps is connected to a nozzle leading from the water-waste

* It is proposed to omit the words in square brackets, and to add the words in *italics*.

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LONDON.—For a complete new system of heating at the school
Wolverley-street, Bethnal Green, for the School Board for London,
T. J. Bailey, Architect:
Hunter-Smith, Gray,
Co. £565 0
J. & F. Pearson, Ltd. 530 0
G. H. G. & Son, 529 12
Spill & Co. 513 0
Comyn Ching & Co. £475 0
Wenhain & Waters, Ltd. 439 0
J. & F. May 410 0
W. G. Cannon & Son 268 10
Southwark (arcanted),

* Accepted.

..... £439
..... 391

..... 359
..... 323
ted,

cal boiler and

Alton-street
..... £ 108 0
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ONGAR.—For new stable and shed, at the union house. Mr. R. Mawhood, architect, Chelmsford.—

F. Noble & Son £296	0	0	H. Barlow (accepted) £155
A. Lemon 159			[All of Ongar.]

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C. Birkell £4,945	12	5	A. Lyons £4,435	0	0
J. Newick 4,804	0	0	Edgar & Sons 4,415	0	0
W. Bellamy 4,771	3	0	R. J. Foley 4,268	0	0
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PONTERFRACT.—For the execution of road works, Furston and Featherstone, for the joint property owners. Messrs. Gariside & Sedley, engineers, Corn Market, Pontefract.—

Day, Speight £1,803	17	10	Jos. Speight £1,435	10	0
A. Bunton & Son 1,744	11	4	Matthew Hall 1,407	11	8
Thos. Lane 1,688	12	6	S. & W. Jowett, Eastwood Bros.	1,647	18
Jas. Bateman & Co.	1,629	11	9	Brighouse 1,357	4

* Accepted by the engineers, subject to being approved by the owners of the property.

PONTYPOOL.—For paving, kerbing, channelling, &c., streets, for the Urban District Council. Mr. John Powell, Surveyor, District Council Offices, Pontypool.—

Lawson & Co. 15	2d	per foot lineal for kerbing;
		15 2d per foot lineal for channelling;
		paving 6s. 4d. per yard super.

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SOUTHEND-ON-SEA.—For laying a pipe-sewer, Market-place, for the Corporation. Mr. H. Harlick, Borough Surveyor, Clarence-road, Southend-on-Sea.—

T. Adams £167	14	7	W. Buxton, Southend. T. Jackson 159	0	0
E. Hies 145	0	0	on-Sea* £144	11	8

* Accepted.

SOUTHEND.—For the erection of a Cripple's Home at Southend-on-Sea, for the Corporation. Mr. G. E. Holman, architect, 6, King's Bench Walk, Temple, W.C. Quantities prepared by Mr. Adam K. Ball, 118 Holborn, E.C.—

E. Laurence & Sons £4,378			Unassigned Tender 1,145
McCormick & Sons 3,499			S. Dark & Son 3,315
Baker & Wiseman 3,491			T. White & Son 3,318
Craig 3,430			

* Accepted.

SOUTHWOLD (Suffolk).—For erecting a small detached villa-residence, Mr. Kd. Mawhood, architect, Chelmsford.—

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[All of Southwold.] * Accepted.

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	s. d.		s. d.
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J. Kine, Candlesby, Lincs.	4	6	8

* Accepted.

SWAFFHAM (Norfolk).—For alterations to workhouse buildings, for the Union Guardians. Mr. Joshua F. Impton, architect.—

Bardell Bros. £395	0	0	G. Jeffries £209
J. F. Impton 257	0	0	S. Howlett, Swaffham 273

[Work to be completed on or before December 31st, 1895.] * Accepted.

WALTHAMSTOW.—For additions, &c., at the Markhouse-road Girls' School, Walthamstow, for the School Board. Mr. W. A. Longmore, architect, 7, Great Alie-street, E.—

Kidder & Son £2,400			R. & E. Evans £1,860
Fuller & Son 2,200			W. Lawrence, Waltham Reed 1,991

Accepted. [Architect's estimate, £1,860.]

WATERLOO (Lancs).—Accepted for the erection of new infant school and cloak-rooms, for the Methodist New Connexion British Secs. Messrs. George & Son, architects, Old-square, Ashton-under-Lyne.—

Charles Keswick, Ashton-under-Lyne £337	15
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WEMBLEY (Middlesex).—Accepted for the supply of road metal, &c., for the Urban District Council. Mr. H. H. Humphreys, C.E., Public Offices, Wembley.—

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Chedzey Bros. £5,750	0	0	H. A. Fosse £5,000	0	0
Horton & Co. 5,793	0	0	Chas. Taylor 4,750	0	0
Sidney Wilcock 5,607	8	6	Chas. Addicot, Weston. H. Hoekings 4,673	19	6
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* Accepted subject to approval by the Local Government Board.

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VOL. LXIX. No. 2755.

OCTOBER 25 1895.

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Staircase Hall, Gosford House.—Mr. William Young, F.R.I.B.A., Architect	Extra Large Page Ink-Photo.
"Teith View," near Doune, N.B.—Messrs. Niven & Wigglesworth, Architects	Double-Page Photo-Litho.
A Small Town House.—Mr. H. F. T. Cooper, Architect	Single Page Ink-Photo.
Proposed Business Premises.—Mr. F. B. Cooper Architect	Single-Page Ink-Photo.

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Bricks, Tiles, and Terra-Cotta.*

THIS is the only large book in the English language on the subject of which it treats. That it has reached a third edition shows it was wanted, though we cannot come up to the standard of what, from view, a text-book should be. This one has been revised, and, in great part, rewritten; so much matter has been added, it may almost be regarded as a new book. After dealing with the history of brick manufacture, and giving some account of the use and constitution of clays for bricks, eng-bricks, fire-bricks, and porcelain, the author states the usual methods adopted in making and burning hand-made bricks, details the manufacture of tempered-bricks, including a description of most modern machinery employed, manufacture of street paving, dry-clay bricks, pressed and ornamental bricks, various types of kilns, their mode of construction and relative quantity of fuel required, the manufacture of fire-bricks, gas bricks, enamelled bricks, sewer-pipes, drains, architectural terra-cotta, ornamental roofing tiles, and the manufacture of mosaics and imitation inlaid and intarsia surfaces.

Commencing with the history of brick-making, there are sundry extracts from Holy Scriptures mixed up with particulars concerning the Washington Monument; and modern machinery *versus* hand methods of making bricks prefaces observations on ancient Egyptian bricks and pyramids. The Egyptian brick is cut in two by the interposition of grooves on what is called Babylonian brick. We do not gather that this part contains anything in the nature of original research by the author, though from the style of writing it might be imagined that most of the information given was new. Beyond mentioning "Layard" and Sir Henry Rawlinson with two minor statements, there is practically no acknowledgment as to the source of the somewhat lengthy particulars on Egyptian bricks. Indeed, the book generally

is sadly wanting in references to authorities from whose works the author has palpably quarried to a large extent. The titles of kings and the dynasties to which they belonged, and many other remarks set forth in the most categorical manner in that part dealing with ancient Nile brickmakers, indicate that the author has yet much to learn respecting modern Egyptology. A sudden leap is taken from the Great Wall of China (211 B.C.), to Spanish-American buildings in California. It is stated that the use of sun-dried bricks has more or less continued in some parts of Spain to the present day, though why that country should have been specially selected it is difficult to say: sun-dried bricks are quite commonly used in many out-of-the-way places in Europe and North Africa. We subsequently leave New Mexico and Arizona for Ancient Greece, the walls of Athens and Mount Hymettus, and it is stated that "the use of bricks for architectural construction was never, at any period, extensive in Greece, but in some few cases they were employed in minor public edifices." Our author is loud in his praise of Roman bricks, and leads us to believe that the Romans adopted the art of brick-burning for the purpose of "embellishing" the Imperial city. It is common knowledge that when the time for the "embellishment" of the city came, the Romans covered up the more prominent parts of the brickwork (especially in interiors) with marble and stonework—at least in the more important edifices. Had the author contented himself with stating simply that both in the Imperial city and other parts of the Empire the Romans extensively used bricks burnt in kilns, he would have been nearer the mark. Still proceeding with the subject of Roman bricks, we are interrupted by the following characteristic observation—"If Pliny could see some of the brick now used, he would quake for the safety of the occupants of some modern hotels, apartment-houses, office-buildings, and dwellings that have recently been erected for speculative purposes in London and some portions of this country." Yet, we may remark, Pliny could not have been altogether ignorant of such jerry-building substances, for he expressly states that the bricks made in Greece in his time were very inferior, and "not fit to be used in the construction of a Roman dwelling, that no party-wall was allowed to be more than 18 in. in thickness, and that the material would not support one

story." Referring to the history of bricks in England, we are told that after the Great Fire of London in 1666 brick was the material *universally* used in the reconstruction of the city, which is, of course, absurd in view of Wren's works. Dutch bricks next claim attention; and the chapter ends with a flourish of trumpets extolling American materials, in the midst of which we are calmly asked to believe that "at the present time, both for quantity and quality, we (*i.e.*, Americans) have no equal in any nation of the world," and so on. The only clay that will make bricks, apparently, is found in the United States, the only machines for brickmaking are of American manufacture, the only kilns of any use are from Buffalo, St. Louis, &c., and the only people who understand brickmaking are in America. Stay; there is an English kiln expatiated upon, the Dunnachie, "for which Charles T. Davis, of Washington, D.C., is the agent in the United States." We wonder the author had the impertinence to insert the words last quoted.

But in spite of all this nonsense, which may fairly be attributed to a prevalent Transatlantic weakness, the book is useful. The "science" in it is of a very low order, it is true, and from the manner in which the various machines are paraded, the reader finds some difficulty in grasping the fact that the work is not a manufacturer's descriptive catalogue for advertisement purposes. If we were to shear the book of any pretensions of being more than a manual on American brick-making plant and machinery, we might be nearer the truth than in dubbing it a general "text-book." The statements in it are not presented in any order except in a rudimentary manner, as may be gathered from what we have already said.

To continue: we next approach the subject of the constitution and fitness of clays of different kinds for making bricks and terra-cotta. The author states that in geological works clays are divided, in accordance with their occurrence, into primary and secondary deposits, which is news to us. Again, clay "in the past has been deposited in the depressions on the earth's surface, and in changes due to the unstable condition of the earth's crust was subjected to heat and pressure and became consolidated, forming a true rock." Thus we are asked to believe that, in being made into a more or less solid material, it is essential for the clay to be subjected to metamorphic action as exemplified by heat and pressure. It is a hopeless

* "A Practical Treatise on the Manufacture of Bricks, Tiles, and Terra-Cotta." By C. T. Davis. Third edition. Philadelphia: Henry Carey, Baird & Co.; London: E. and F. N. Spon, Low, Marston & Co., Limited.

jumble of facts twisted by unscientific hands into a meaningless sentence; the author evidently does not understand what he is writing about. There is a great deal more of a pseudo-geological nature in the work, but we shall not refer to it—it is beyond criticism.

That part dealing more particularly with the ingredients of common clays and their effects in the kiln is better, though we cannot quite agree that the silica furnished by sand is *necessary* in order that a partial fusion of the materials may take place. Such fusion can be, and often is, brought about without any free silica being present in the raw materials of which bricks may be made. Again, at first sight, one might imagine from what is said, that the addition of free silica causes the whole clay to fuse. As a matter of fact, silica, *per se*, is practically infusible, though it melts in presence of a suitable flux such as is frequently found in clays. On the whole, however, the information concerning the suitability of divers clays for making bricks is good, though the author has not always a happy way of putting it. Here is a sentence: "Salt melts readily and glazes the outside of the brick, and the heat cannot be raised or maintained sufficiently long to burn them to the core, or into good hard brick." Anyone can see what the author means, but the words are badly strung together.

Clays for building-bricks are divided into three classes: 1, Plastic, or strong clays, chiefly silicate of alumina; 2, loams and mild clays, where there is a considerable proportion of sand mixed; and 3, marls, or calcareous clays containing a notable quantity of carbonate of lime. As a general rule, says the author, a clay fit for the manufacture of a first-class quality of building brick is not met with in Nature. There is almost always a deficiency of sand and lime. A good brick clay is one that contains sufficient fusible elements to bind the mass together, but not so much as to make the bricks adhere to each other or become vitrified. Such clays contain from 20 to 30 per cent. alumina, and from 50 to 60 per cent. silica, the remainder consisting principally of carbonates of lime and magnesia and oxide of iron. That is very well put, but it should have been added that the proportion of the carbonates and the oxide alluded to should not pass a certain limit. For instance, suppose a clay contains alumina and silica to the extent of 70 per cent. (which is permissible by the statement made), it would never do to have the remaining 30 per cent. of iron alone, or carbonate of lime alone, though in Switzerland they make a fair brick with a high percentage of lime, which they are enabled to do by reason of certain peculiarities in the other ingredients of the raw earth used. A building brick could be made even with a higher percentage of lime, but it would, in the majority of cases, be a very inferior one.

A great deal is made of the chemical composition of the divers earths described in the book, and the author endeavours to show the connexion between that and the effects produced in the kiln under high temperatures. It is admittedly a difficult subject, and we think this part of the work is excellently done; clearly the author has had a great deal of experience either in the laboratory or in the brickfield with the behaviour of clays under differing temperatures. The relation of the structure of clays to their chemical constitution, and the combined effects of these two properties in the kiln, is not adverted to, except in a rough way. Some day, when the structure of clays is more generally understood, it will be found to be an essential factor in the value of the earths for brick-making.

In the section devoted to "drying" bricks preparatory to their being placed in the kiln, the author gives the following instructions:—"The first step in the drying of hand-made bricks is to turn those upon edge that were made on the previous day. If there are no indications of rain, the bricks are 'turned

up' early in the morning, and allowed to stand upon edge, exposed to the sun, until about four o'clock in the afternoon, when they are taken into the drying-shed." We do not know how it may be in America, but if bricks were attempted to be dried in that fashion in England they would not be worth putting into the kiln. The author is not very particular with some of his statements on these preparatory stages. For instance, we are told that "washed bricks" (*i.e.*, those accidentally exposed to rain before having been well-dried, or burned) have a rough appearance, and are generally not much esteemed, "but they make the strongest brick that come out of a kiln; and when hard-burned, they have no equal for foundation or sewer-work." That may be with some earths, but it cannot possibly be applied to all that are capable of holding together in the rain.

We have nothing but praise for the section dealing with "burning"; it is the best dissertation we have seen on the subject. Passing over that part wherein a large number of brick-making and other machines used in clay-work are described in detail, and on the construction of kilns, our attention is arrested by observations on drain-tiles, which are also very good. With reference to drying drain-tiles it is remarked that different clays require different methods of drying, for, whilst some tile-clays are so tough as not to dry properly in the sun, others are so tender that it is difficult to dry them in the air. It is the lack of uniformity and the employment of too high a temperature at first in drying, and not the rapidity with which the tile is afterwards dried, that in most cases causes the tile to crack. Drying the surface too rapidly will crack the green tile, for the reason that the centre of the tile is raw, and does not shrink as rapidly as the surface.

The author starts badly in the chapter devoted to the manufacture of architectural terra-cotta. He says that "terra-cotta is to-day the most available material used for the construction of buildings of all classes and forms." Whatever merits terra-cotta may possess, we have never heard it specially praised before on account of its "availability." In general, it does not seem to be particularly "available," at least, "jobs" are very frequently kept waiting about for it. Although it is admitted that the use of terra-cotta dates from remote antiquity, it is amusing to note that "brick was the building material of the antediluvian days." Skipping the parts in which terra-cotta is strongly recommended for "ornamentation," and so forth, we note that the author classifies terra-cotta into (1) its fitness as a substitute for stone, &c., and (2) as a building material pure and simple. He insists that some architects are too exacting in ordering terra-cotta. "They would select a chip of natural stone, and demand that the clayworker do an impossibility, viz., reproduce that exact shade of colour." The proper use of terra-cotta demands (1) moderate size of pieces, (2) easy manipulation of the surfaces, (3) consideration in the construction, (4) protection of the exposed joints, and (5) freedom of shade in colour. It might have been added that a careful consideration of the "filling" is essential. The process of manufacture is subsequently described, and some account of ornamental and roofing tiles brings the book to a close.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND

By PROFESSOR BALDWIN BROWN.

III.—The Place of Saxon Structures in the General History of Medieval Architecture. PART I.—The Basilican Plan and its Modifications.

THEN the first of these papers a glance was taken at some of the principal varieties of plan observable among Saxon churches, and there now arises the question—how are

these plans related to the normal form of Mediaeval buildings, as they appear in successive ages of Western architecture? Various types of ecclesiastical buildings show themselves in our own country during the Saxon period, and it is a mistake to treat them, as they are too often regarded as isolated phenomena, without any relation to similar forms appearing in other lands. We require to know where to place Saxon buildings in the general process of the evolution of the architectural form of the Middle Ages. In most cases there are parallel examples either on the Continent or in other parts of our own islands, and with a reference to these we cannot properly know our native English work. Reference and comparison are especially valuable when it comes to questions of date. The dates of Saxon buildings are matters of never-ending discussion, which is too often carried on without due use of the means of comparison. Certain types of buildings belong to particular periods of Western architecture in general, while at other periods the same types would be practically impossible. Now, warm-hearted enthusiasts often claim for Saxon structures an antiquity in epochs when they would have been less than miraculous. When a specimen of pre-Conquest building, surely advisable to ask whether, at the period in question, forms of the kind are recognised in Western architecture as a whole. In this comparatively outlying region of the West, we can hardly expect designers of buildings would have been in advance of their brethren in the great centres of European culture. It is true we find in the architecture of Southern England certain peculiar forms unknown on the Continent, and due to the fact that the British Isles were only in part Roman. It is true, also, that descriptions of the famous Saxon buildings exhibit themselves fully in line with, and even at times lead the advance of Western architecture in general. It would be a mistake, however, to exaggerate this, and to credit the Saxon designers with revolutions in the art of church-planning, or with the erection of strokes of forms centuries in advance of their time. There must, in the nature of things, be a certain parallelism between work done in one part of the world and elsewhere, and if we can establish a normal scheme of development in architectural forms of Western Christendom, we shall have laid the soundest groundwork for settling some of the disputed questions about the date of pre-Conquest churches.

Taking, then, the forms of Saxon buildings in order, we may note that between the British and Continental structures there is a distinction residing in their square terminations at the altar end. Abroad, through the Romanised West, nearly all the Christian and early Mediaeval churches are apsidal. The square-ended choir appears later on, under the influence first of the Cluniac revival in the tenth century, and of the Cistercian movement in the twelfth, but is pretty well confined to churches erected in these connexions. In England, however, some of the earliest Saxon churches, such as Escombe and Bradon-Avon, are square-ended, and all through the pre-Conquest period the apse is an exceptional form. This points to a Roman origin for a large number of early churches, and opens up the question of Celtic influence. The almost complete absence of side-aisles, the great proportionate height of the walls and steepness of the gables, as at Monkwearmouth, and the comparative narrowness, are also unclassical features, and give to the study of early churches a special interest that is lost sight of by writers who are too ready to call them "basilicas," or to assume that designs of them were derived from Roman prototypes. These abnormal or non-Roman features of our early architecture will be discussed in connexion with the subject of Celtic influence.

subsequent paper. At present we will read only those features which are Classical in their origin and character, such as the apse, the piers, and will ask what light is thrown on native work by a comparison of it with what was being produced in the Continental schools.

In order to fix the position in Western literature of Saxon buildings, it will be convenient to glance for a moment at the general course of evolution by which the mediæval styles were formed. In the Early Christian architecture of the West the one standard form for churches used for congregational assembly was the basilica, though this is by no means the only form known to Christian builders. The word "basilica" is often used by early writers in a loose sense to mean any kind of church, but in its proper significance it applies to the spacious, lofty, comparatively low edifices, very richly constructed, divided into nave and aisles, lighted by a clearstory, and terminated at the altar end by an apse, of which the most characteristic examples are to be seen at Rome and Ravenna. Now, the Early Christian basilica has been made more than its fair share of work in the development of ecclesiastical architecture. It has been assumed that the basilica and a few centuries of time were all that was needed for the production of the Romanesque style of the Later Middle Ages, but the fact is, that the basilica, when taken by itself, was strangely lacking in the necessary elements of growth. The Romanesque style derived from the basilica the general scheme of its rectangular plan, its division into nave and aisles and clearstory, and its apsidal termination, but for its main characteristics, such as stone arches, the use of pillars instead of columns, piers, transepts, a choir as the extension of the nave, the central pavilion or tower, and over side aisles, façades composed of a tower or towers, and the like, we have to look to other buildings than the basilica. It is not too much to say that the gradual progressive modification of basilican forms, by which Romanesque architecture is really explained, is really a figment of the imagination. The Romanesque style depended its formation, not on the modification of the basilica from within, but on the grafting of the simple basilican scheme of more elaborate architectural features that originated elsewhere. The source of these is to be sought in the round or polygonal and the form churches that were erected from earliest times, not for worship, but for burial or sepulchral purposes, or simply as temples. These exceptional buildings, from the first far more architectural in character than the basilicas. Their plans are more complicated, but, at the same time, more compact, their technique more advanced, their construction more daring and masterly. Buildings like San Lorenzo at Milan, San Ambrogio at Ravenna, and Charles the Great's chapel church at Aachen, contain all the constructive and artistic elements that in different combinations make up the Romanesque church. They exhibit, first, a central nave with a side (or rather concentric) aisle, and itself carrying a vaulted gallery opening into the central space, which is also vaulted with a dome in masonry. Access to the gallery is gained by stairs in the transepts, and these, at San Vitale and at Aachen, are grouped on each side of an entrance-porch, thus prefiguring the most characteristic feature of the Romanesque church. At San Vitale we find even that mark of advancing Romanesque, the polygonal choir or chancel preceding the

There are some of the characteristic features of Romanesque architecture, and that the mediæval builders had to do was to combine these with the rectangular plan, and was the contribution of the basilica. In the nave and where the necessary steps were made, it is impossible, in the present state of knowledge, to say. It is clear that the basilica in itself contained no principle of

growth, or we should be able to trace the beginnings of Romanesque at Rome and at Ravenna. At Ravenna, however, the basilica maintains throughout its simplest fundamental form of nave and side aisles, with an apse opening directly into the former, and the latter unprovided with galleries. At Rome certain innovations on the bald basilican form make their appearance, but in such a way as to show that they were rather accidents than stages in a progress. Many of the earliest Roman basilicas, especially those of the larger kind, show a rudimentary transept in the form of a clear space across the church just before the apse. So far, however, from this becoming a normal feature and leading on to the more complex Romanesque plans, it actually dies out of Roman architecture altogether, and the later basilicas of the metropolis never show it. Similarly, we find at one particular period of the history of the Roman basilica, the gallery introduced over the side aisles. This is not, however, a symptom of incipient Romanesque, but a passing fashion, introduced probably from the East, which made no permanent impression on the basilican plan.

It is curious, indeed, to note how unproductive in new architectural forms were the builders of Rome herself during the Early Mediæval period. Rome, the mother of ecclesiastical statescraft, was in matters of art the most unproductive of all the centres of the West. As her architects had constructed in the fourth century so they continued to build in the twelfth and thirteenth, and after one solitary attempt at Gothic at Sta. Maria Sopra Minerva, the Early Christian style passed at once into that of the Renaissance. This is a fact to be remembered when we find mediæval writers speaking of Rome as a place of architectural inspiration. For the seats of the new experiments in construction and planning which transformed the Early Christian into the mediæval style, we should probably be right in looking away from Rome altogether to the more northerly districts of Italy, the metropolis of which is Milan, and beyond the Alps to centres like Cologne, or Tours, or our own York. Here classic and barbarian elements of culture met and mingled, and though there may not be anything specially Teutonic in the forms thus evolved, it may well have been the case that the contact with new social forces embodied in the Northern peoples stimulated inventive genius in the *alumni* of the older schools. The centuries from the sixth to the ninth must have been in this respect of great importance, and it is a matter of some national pride to find that, in one conspicuous instance, the church built by Wilfrid at Hexham at the close of the seventh century, our country was doing its full share of work in the formation of the mediæval styles. Until the age of Charles the Great, however, our knowledge of what was going on is fragmentary and obscure, and in the great dearth of monuments the date of which can be fixed, is chiefly derived from literary sources.

There are several of our Saxon churches that may fairly lay claim to an origin in this early period, and in their case it is interesting to note what modifications they exhibit of the simple Early Christian plans. Silchester seems to present to us a fairly normal Early Christian design on a very small scale, and there seems no reason to doubt that it is Romano-British, and represents with St. Pancras at Canterbury the oldest tradition of church-building in the country. On the other hand, in two somewhat later examples of the basilican plan, in the churches of Reculver and Brixworth, we discern some modifications that look on to mediæval days. In both these buildings the apse does not follow immediately on the nave, but is preceded by a sort of square chancel, cut off from the nave by an archway or group of three-arched openings. At Reculver (fig. 7)*

the arches of these openings were carried in the centre on two columns of Roman workmanship, and started at the sides from piers that are constructed of Roman brick. Whether these arches with the wall above them originally formed part—in all probability the porch—of some Roman building, or whether it is only the materials that are Roman, we cannot tell. The fact that this part of the masonry accords with the orientation of the church, would suggest that the materials were put together for Christian use, and the fact that a similar screen between nave and chancel seems to have existed at Brixworth bears out this supposition. The feature is a curious one, and does not occur, at least in the West, in any known Early Christian Church on the Continent. It seems to contemplate a separation between nave and sanctuary that is rather Oriental than Western, and rather mediæval than Early Christian. One might be tempted to ascribe it to the inability of the masons to turn a single arch of the needful span (at Reculver 20 ft., at Brixworth 25 ft.), and we may note that the same contrivance of three arches in the place of one occurs at the chancel opening of the Saxon church of Bracebridge, near Lincoln, and the opening to the church of the Early Norman tower at Jevington, Sussex. On the other hand, the apse at Reculver, if finished in the Roman fashion, would have required a vault 25 ft. in span, compared with which a single arch 20 ft. wide would have been a simple matter. (How was St. Pancras roofed? The walls are only 2 ft. thick, and there is no sign of the piers of an arch in front of the apse.) The spaces at Reculver and Brixworth, within the screens but before the apse, are more important than the screen itself. Brixworth is claimed by many as Romano-British, and so excellent an authority as Mr. Romilly Allen, in his valuable "Monumental History of the British Church," says that it "may be taken as the best typical example of a Saxon Church most nearly approximating to the Roman pattern." The distinctly marked chancel is, however, a feature not found in any basilica at Rome or at Ravenna. It may be a modification of the transept-like space observable in several instances at Rome, but it looks much more like an approximation to mediæval planning. The space at Reculver is much smaller, and bears out the view that the church belongs to an earlier date than its Northamptonshire sister. There are many other points about Brixworth well worthy of discussion, for which there is no space here. It is sufficient to have noted that even in our most "Roman" churches there are features which in the light of the comparative method are seen to need study and elucidation. The fact that pillars instead of columns are used to divide nave and aisles is to be noted, as the pillar basilica is an innovation on the earlier columned form. In this country, however, it would be an almost necessary consequence of the absence of the marble column shafts which were so abundant in early Christian times in Italy.

Some early Saxon buildings, however, showed far more important modifications of traditional Early Christian forms than those just discussed. The most interesting monument of the kind is Wilfrid's church at Hexham, which is known to us from the accounts of several writers, the earliest of whom was his own chaplain, Eddius. They all agree in representing it as exceptional in size, solidity, and excellence of workmanship, and it seems to have specially struck observers for the multiplicity of its parts. We read of its three distinct stories of interior elevation (an arrangement mediæval but not early Christian), of long passages and galleries, approached and joined by winding staircases in towers; of numerous side-chapels, porches, and oratories; of crypts and underground chambers constructed wondrously of smoothed stonework. This all sounds very unlike one of the simple, slight basilican structures of Rome or

* See page 216 ante for the plans of churches referred to.

Ravenna, splendid in its decoration, but without any architectural pretension save that based on its imposing size, and it is unfortunate that the term "basilica" is so often applied to Wilfrid's edifice. Mr. C. C. Hodges states that "it appears that Wilfrid's church was designed on the model of the great basilican churches of Rome," and quotes William of Malmesbury, who tells us that Wilfrid's masons came from Rome. For "Rome" we should certainly read here "Romanised lands," for not only was Rome, as we have seen, by no means a source of architectural inspiration, but stone masonry was not a Roman art. All the early Christian buildings in Rome are of brick, not of stone.

To call Wilfrid's church at Hexham a "basilica" is to obscure the most interesting point about it. It was not a basilica, but a building far more resembling such an Early Romanesque church as St. Pantaleon at Cologne, where there are transepts, galleries over the side-aisles, towers with stairs of access, the "three stages of interior elevation," i.e., ground story, triforium, and clear-story, and the like. St. Pantaleon, however, dates, at the earliest, from the end of the tenth-century, and Wilfrid was building at the close of the seventh. It would be hard to say where in Western Europe one would look to find another instance of so advanced a building at that epoch. The church on the plan of St. Gall, of about 820, is certainly not so far developed. It is cruciform in plan, but there is no sign of galleries or of stair-turrets connected with the main building, no room for ascending and descending passages. It is not to be overlooked that Wilfrid built another church at Hexham, of the central type, rising like a tower, and polygonal in form (*ferè rotunda*), with four adjuncts giving a cruciform character to the plan. This shows that his attention had been directed to central churches, and he must have become familiar with the more advanced constructional features presented by churches like San Lorenzo and San Vitale when compared with the Basilicas. It is quite possible that he or his advisers may have made a real step in advance in an endeavour to graft some of these features on the basilican scheme. This same process we know to have been going on in the Carolingian period, which is generally held to mark the beginning of Romanesque as distinct from Early Christian architecture. It is an important fact in architectural history that Wilfrid was doing the very same thing more than a century earlier, and we may claim for Wilfrid's northern diocese a place among the localities where this architectural history was made.

NOTES.

T is announced that Mr. W. R. Lethaby will deliver two lectures on "Modern Building Design," in connexion with the work of the Technical Education Board of the London County Council. The lectures are to be given at the Central Art Department of the Board, Bolt-court, Fleet-street, on Saturdays, October 26 (to-day) and November 2, at 3.30 p.m. The lectures are specially addressed "to architects and architects' pupils." We presume this is the first foreshadowing of that scheme for architectural teaching to be organised by the London County Council, to which reference was made by Mr. Caröe in his Presidential address at the Architectural Association the other day. Whatever we may think of the scheme in a general sense, there is no doubt that we shall all of us be very glad to hear what Mr. Lethaby has to say.

THE Glasgow Architectural Association has offered a prize of five guineas, open to all members of the Association, for the best essay on "The Distinctive Qualities of Scottish Architecture." This is a very interesting subject, which has perhaps hardly received sufficient attention, having been only touched on occasionally in a partial

and desultory manner by writers on architecture. The castellated architecture of Scotland has received systematic illustration at the hands of Messrs. M'Gibbon and Ross, but it is in ecclesiastical architecture that Scottish peculiarities are most distinctly marked, and this part of the subject has hardly been sufficiently followed out and illustrated. It is to be hoped that the essay to which the prize (not a very large one), is awarded will be a valuable contribution to architectural criticism.

THE Purcell celebration at Westminster Abbey is to be held on November 21, and its proceeds will be given towards a new case, designed by Mr. Pearson, R.A., and estimated to cost 2,000*l.*, for the organ, which was originally built by Schneider and Jordan in 1730, and presented by George II. The *Daily News* announces the recent discovery by Professor Bridge, in the Muniment Room, of an order by the Dean and Chapter, 1604, to Purcell and the Precentor to arrange with Father Smith for an organ to cost 200*l.*, with the request to Wren, 1701, to give an estimate for its case. Smith had built an organ for the Abbey in 1660. According to Grove's "Dictionary of Music," Purcell superintended the erection of a new organ for the coronation of James II. and his Queen. Schneider and Jordan's organ, since greatly enlarged, was reconstructed in 1848, by Hill, and again in 1883, when some additions were made by the gift of Mr. A. D. Clarke. Purcell's grave is adjacent to those of Arnold, Sterndale Bennett, Blow, and Croft, in what has been not inaptly called the "Musicians' Corner" of the Abbey. Its inscription, in brass letters, was restored in 1876 by a public subscription set on foot by the late Dr. Turle. The familiar lines—

Here lies
HENRY PURCELL, ESQ.,
Who left this life
And is gone to that Blessed Place
Where only his Harmony
can be exceeded.

are cut in the white marble tablet that was set up against the second pier of the nave (counting from the cross), by Lady Elizabeth, *née* Howard, Dryden's wife. The second son of Henry Purcell, gentleman of the Chapel Royal, and master of the choristers, who was buried in the east cloister, 1669, Purcell was born in a house, since destroyed, in Old Pye-street, Westminster. He lived for some while in St. Anne's-lane, a turning out of Old Pye-street, where another musician, Dr. Heather, *obit* 1627, had also resided. In 1680 he was appointed organist of the Abbey: he died in his official residence, afterwards pulled down for the Precentor's house, on November 21, 1695, in the thirty-seventh year of his age. In Wyck-street stood a tavern, the "Purcell's Head," having for sign a half-length figure, remarkable for its green gown and portentously large wig of the kind once known as a "buzz."

THE Town Council of Sheffield had a long discussion or dispute last week, and seem to have been very much divided in opinion, on a point on which there ought to be no two opinions at all. It appears that the Improvement Committee had received tenders for the furnishing of the Town Hall, and had written to certain firms which were lowest informing them that certain of the contracts would be placed in their hands; when fourteen days afterwards they received a communication from the firm which had tendered highest, to the effect that their clerk had made an unfortunate mistake in some calculations, which had caused their tender to be far higher than it should have been, and asking permission to submit an amended tender. Permission was granted, and the amended tender turned out to be slightly below one of those already accepted, and the work was accordingly given to the amending firm. It would probably strike a good many people, on reading the report of the discussion in the

local papers, that there was a curious censure in the fact of the amended tender being reduced just low enough to be claim to acceptance. But however that be, there can be no sort of doubt that the Improvement Committee were wrong in first instance in allowing an amended tender to be sent in, and that the Council were very weakly in not quashing the decision of the Committee. In fairness to all who tendered, especially for large contracts, date named for opening tenders ought to be absolutely adhered to, and firms which do not do without making mistakes in tenders must abide by their mistakes. On other course is, to say the least, exceedingly unbusiness-like, and is liable to any worse construction.

DR. FLEMING'S report to the Plymouth Electric Lighting and Traction Committee is well worth reading by all interested in the future of electric lighting. The speaker advises—an alternating current transformer sub-centres like the one at Tunbridge Wells which we have described—is the one which is becoming most popular with electrical engineers. Dr. Fleming's remarks on the importance of good street lighting, which the benefit of all ratepayers alike, are to the point. The most interesting of his report, however, is that which treats of the employment of refuse destructors for power purposes. No one might seem more obvious than to suggest that one station would be sufficient for the destruction of refuse and generation of electricity for lighting and traction. Dr. Fleming points out the objection to this arrangement, namely, the heat obtained from the refuse-destructors would not be nearly sufficient to work engines at their full load, and hence some thermal storage system would have to be adopted. Whether the system proposed by Mr. Druiitt Halpin, and adopted in Shoreditch Vestry, will work safely and economically in practice has yet to be seen. He, therefore, advises that the refuse destructor station be entirely independent of the other, but at the same time contiguous to it, so that in the event of Mr. Druiitt Halpin's scheme being successful it could be adopted. He rightly thinks the main question in the construction of a refuse-destructor station is the sanitation. He also advises that the lighting and traction machinery should be quite distinct, although the engines may be supplied with steam from the same battery of boilers. As a particular system of electric traction has been adopted, he sums up strongly in favour of the overhead trolley, giving figures to show that this system is a very profitable one.

THE new municipal buildings for Cardiff, as proposed in a rough sketch submitted by Mr. Seward to the Western Committee a few days ago, appear to promise an important public improvement for the town. The buildings have been planned on the sides of a quadrangle, with a garden centre, and a further open space for extension, and at present also to be laid out as a garden. A new street, raised as a terrace, is shown to flank the building on the adjoining Cardiff Arms Park, towards the principal elevation will face. It may draw attention to one important point before it is too late. What is expected to be the amount of traffic along this street? If it is likely to be a street in which much traffic will pass, it is certainly a mistake to place the Council Chambers directly on the street. Absence of disturbing noise from without is most essential for Council Chambers or Committees, and such rooms should always be kept apart from public streets where possible.

THE Architectural Society of Vienna have been carrying out a series of tests to determine the relative strength of vaults, in regard

section and material. These, which were commenced in 1890, are now completed. They were carried out under the management of a committee of twenty-one architects, engineers, and have cost the Society 2,000*l.*, though many of the contractors employed did their work gratuitously. The plans have now been published in the form of a report, which can be had from the Secretary of the Vienna Architectural Society at the price of 14 florins (about 1*l.* 3*s.*).

THE model of the monument to the deceased painter Makart, which is to be erected at Vienna, has now been completed, and is being exhibited at the studio of the sculptor, Herr Tilgner. The site for the monument is on the main boulevard (Karlstrasse), near the City Park. The model is the deceased painter in a Malay costume, which he wore at the last great *Salon* which he attended, and is considered an excellent portrait. Similar monuments will be erected in memory of deceased artists Schindler, Waldmüller, Pettenkofen. The Schindler memorial is the hands of Professor Hellmer, and also be erected near the City Park. An elaborate tombstone has been lately erected by the municipality in memory of Makart, and another is to be erected over the grave of the deceased architect, Baron Hasenauer, the cost of which will be defrayed by his former assistants and the others who worked under his directions. The design is by Baron Hasenauer's successor, Heinrich Hofer, and the sculptor Johannes

ESSRS. ROUMIEU & AITCHISON, architects, have just sent in a report to the Mayor and the Corporation of the City of London, at the request of the Mayor, on the state of decay of the cement wall-covering of the brick-built church. The report was submitted by the receipt of a "dangerous" notice from the London County Council. The church is credited to Wren, and this attribution seems uncertain. The report of the architects have drawn attention to the need of internal re-decoration. This, however, with the absolute necessity for external repair, is a question of money, and may have to be abandoned. The tower of the church is said to have been erected by a Dutch architect, and certainly the design of its finial recalls Dutch architecture in such matters. There are two distinct existences showing alternative treatment for the tower.

It is stated that the Governors of Queen Elizabeth's Free Grammar School of Salford, Southwark, intend to remove the school to some convenient spot in the suburban districts. The foundation, whose small income has increased of late years, was established by William Emerson, *obit.* 1588, and some "other discreet and sad inhabitants of St. Saviour's" for the boys of both poor and rich parishioners. In 1562, they bought part of the "Green" of Lord Cobham's Inn, a town of Lord Cobham, of Sterborough—Mrs. E. Beger, in her book, "Bygone Salford," 1895—which stood on the south side of the churchyard. On June 4 of that year, Queen Elizabeth gave the Governors a charter of incorporation. During the fire which consumed much of this quarter of the Borough in 1676, the schools buildings were burnt up with gunpowder to stay the course of the flames; but they were speedily re-erected. The later school-house, which was pulled down, in 1839, was an extension of the neighbouring Borough of Salford, and is illustrated in the *Mirror* of 1838, 1840, and in Wilkinson's "Londina." Upon the existing premises were built in Summer-street, near St. Peter's Church, on a plot of ground given by Dr. Thomas Sumner, Bishop of Winchester, the Corporation of the cost being defrayed by the trustees of Miss Hyndman's bequest, known as "Hyndman's Bounty";

the parishioners contributed 1,700*l.* The buildings are of brick with stone dressings, after the domestic Elizabethan style, and were designed, we read,* by Christopher Edmonds. In this school was educated Dr. Heberden, who endowed the master's salary with a donation of 500*l.* About fifty years ago a scheme of the Court of Chancery provided for a revision of the statutes, and the foundation is now open to all. The new buildings are to provide for not fewer than 200 boys.

THE proposal to form a branch Architectural Society at Plymouth, in connexion with the Devon and Exeter Architectural Society is to be discussed at a special meeting at 11.30 to-day (Saturday) at the Plymouth Athenæum. It is to be hoped that the result will be satisfactory. The Hon. Secretary for the Plymouth Local Committee is Mr. S. M. Leest, Laboratory House, Devonport, with whom architects who are practically interested in the movement can communicate.

SANITARY authorities in Cornwall appear to be very hard to move. In his last Report to the Cornwall County Council, Mr. Trevel, the Chairman of the Sanitary Committee, says: "Typhoid fever is on the increase. From 16 cases for August it has risen to 23 for September, with the same number of deaths as last month, viz., 4. The worst places for this month are Helston (Rural), 3 cases and 2 deaths; Helston (Urban), 3 cases; St. Ives, 4 cases; and Truro City, 5 cases and 1 death. At Helston the disease has evidently been caused by polluted pump-water, whilst at Truro, the fact of the outbreak synchronising with the bad smells referred to in last month's report points to its source. Notwithstanding the repeated advice of the Medical Officer of Health, and the pungent words contained in his last report to the City Council on the condition of the city's drainage, the majority of the Council seemed determined to continue the policy of polluting the river with sewage until a superior authority insists upon the execution of an efficient drainage scheme."

THE small Birmingham art-paper, entitled *The Quest*, is to begin a new series in November, in the hands of new publishers.† The paper is hand-printed at the press of the Birmingham Guild of Handicraft, and the style of printing and of decorative letters and headings is very good, but this has hitherto been accompanied by bad figure-drawing, and representations of architecture which can only be called puerile in style; and we are not promised any improvement in this respect. The figure on the front page of the publishers' announcement sent to us, and which we presume is intended as a specimen of the style of illustration to appear in the magazine, is ridiculous as a specimen of figure-drawing, being entirely out of proportion, as the reader may see from the reduced copy of it here given. The pretence at a superior style in decorative design, coupled with the neglect of figure-drawing and the distortion of the true proportions of the figure—the grandest element in decorative art—can be the result of nothing but a foolish affectation which is entirely at variance with what is sound and healthy in art.



* Mr. Walford's "Old and New London."
† Messrs. Napier & Co., Birmingham.

AS there is likely to be a great run on "Trilby," the dramatised version of Mr. Du Maurier's novel, it will probably be matter of general interest to the public that all Mr. Du Maurier's illustrations to the story (which to our thinking constitute its principal claim to attention) have been purchased by the Society of Fine Arts, and will be exhibited in their rooms about the same time that the play is produced, the private view being fixed for November 1.

AFTER one has got a little used to them, one may find a good deal to admire among the modern Dutch water-colour drawings at the Goupil Gallery. It is at first rather depressing to see so many things that look (to the prejudiced eye) rather like smears than pictures, and to come across landscapes apparently painted in various shades of ink, and destitute of either sunlight or colour. But by degrees we discover that Offerman's "Marchand d'Antiquités" is a really fine painting of bric-à-brac disposed around a figure, and is rich in colour in a restrained and sombre way; that Van Mastenbroek's "Rotterdam" is a very fine composition with a grand style about the sky; that Du Chattel's "The Lake Farm," however grey, is also a thought in landscape, with the white houses just in the right place; that Midlle Valkenberg's "The Eident Hand" is a very good "interior with figure"; that every muddle of sheep by Mauve, however grimy in colour, has artistic purpose in it; and that Vrolyk's "Milking Time" shows an admirably-painted cow combining most artistically with the landscape. And so on the whole we go out happier than we came in, only wondering why it has pleased Providence to deprive so many able men, whose artistic instincts are undeniable, of the ordinary perceptions of daylight and colour vouchsafed to otherwise inferior members of the species.

AMERICAN OPINION ON ARCHITECTURAL EDUCATION.

THE printed record of the twenty-eighth annual Convention of the American Institute of Architects, held last year at New York, has just been issued as a handsomely-printed volume of about 200 pages. There is a great deal of interesting discussion in this volume upon many topics connected with architecture, to some of which we may return. At the present moment, when we are all a good deal occupied about architectural education, it may be of interest to reprint here the report on the subject of education, drawn up by Mr. Van Brunt, as Chairman of the Education committee. The education problem may in some questions of detail differ from that which is presented to us in England, but in the main the position is much the same on both sides of the Atlantic. The report in question is interesting not only from its intrinsic merit and from the broad and ambitious views expressed in it, but also because it rather reminds us in some passages of the view taken by the late M. César Daly in regard to the necessity for a philosophic study of the past of architecture, in order to understand properly the needs of the present and future, and to make a choice of style and treatment on intellectual grounds, and not merely at the hazard of taste and predilection of the moment. After some preliminary remarks, the Report proceeds:—

"We consider that the present condition of architecture in this country as a fine art, though there are clear indications of a late advance in academic scholarship, and in *technique* generally, is unsatisfactory, because in this advance there cannot be detected any healthy progressive principle. In fact, it is rather a progress of personal enterprise and skill than of principles, and does not seem to promise any large or characteristically national fulfilment. It is made on irregular skirmishing lines, not without evidence of individual gallantry here and there, but with none of that effective unity of effort, which is the only means of achieving results adequate and proper to our especial civilisation.

As architecture is now for the first time in the hands of men of education, it becomes very important indeed for us to consider whether this education cannot be such as to inculcate convictions, to make our young architects the

agents of a far more definite and orderly progress, and to inspire them with a certain definite consciousness of duty in respect to the development of a system of architectural forms, less conventional in character, and more accurately adjusted to the expression of our new life.

But it may be said, 'Let us be content to do our duty to our art and to our clients, each one to the best of his ability and according to his best lights, and let the style of our time take care of itself, as the styles of former ages and peoples have been created. For these historical styles have developed themselves out of political, religious, commercial, ethnological, and social conditions, and *technique* has varied with variations in materials and methods. Why should we attempt to interfere with this natural automatic process of evolution?'

In the answer to this question is involved a statement of the difference in the conditions in practice in ancient and modern times. But it seems hardly necessary to repeat this statement before such an audience as this, and to say again that our past is a far larger region, a far greater inheritance, than belonged to any of our predecessors, and that our minds are preoccupied and our ideas complicated by an infinite variety of architectural monuments.

The progress of investigation in archaeology has made us familiar with the buildings and arts of every age and race; we have classified and defined the styles; we have theorised infinitely and created a science of esthetics. We can therefore no longer be like our predecessors—unconscious ministers in the development of style. As our resources have been infinitely expanded, our personal responsibilities to our art have become far greater and our task far more difficult. Architecture has thus necessarily become a learned profession, and we cannot do our duty without academies, libraries, and museums, and a large equipment of photographs and prints. The architects of the great historical eras, dealing with comparatively simple problems, and with only one set of forms at a time, were enabled to concentrate their forces, and with infinitely less style without affectations, and with infinitely less consciousness of effort than ourselves, who are distracted by our knowledge and perplexed by our exacting reminiscences.

These conditions have introduced a new element into the practice of architecture, an element of self-consciousness, of dilettantism and imitation, which have sophisticated modern architectural manifestations and deprived them of that sincerity, power and simplicity, which can result only from concentration of intelligent effort and from strong convictions, based, not upon the traditions of the studios, but upon a philosophical analysis of our vast resources of design.

Without presuming to criticise the methods of instruction in our schools of architecture as at present conducted, and certainly with a grateful appreciation of what their professors and teachers have already accomplished in the service of a purer and nobler art, we would ask them to systematise and co-ordinate the study of all the historic styles, as they were successfully developed in their progress from picturesque barbarism to the elegance and refinement of the higher civilisations; to make this study an essential part of the curriculum of the schools; to teach the outlines of history by the architecture which was a part of it; not to select certain of the styles for exclusive study, leaving what seems the less interesting and beautiful, the less highly-organised or less applicable to our use to be picked up by chance, if at all. Our project would be to pursue this study of history through its manifestations in architecture from archaic to modern times, or at least to the nineteenth century, not with the minute, patient scrutiny of the archaeologist, but with the spirit of the artist, seeking to learn how forms and ornament were developed out of the genius of civilisations and peoples, and how, as they were significant of the progress of human culture in the past, they should be used in the service of modern art.

We recognise that the best discipline of the faculties of design can be obtained only by especial and continued practice with the most highly-organised of all these styles, and that classic art must continue to be the *means*, but not the *end*, of this discipline.

We believe that this organised study of the historical styles would prevent the graduates of our schools from becoming mere spendthrifts with their inheritance, and that with this new knowledge, apparently never heretofore taught, they would learn to be tolerant. 'Savoir c'est pardonner.' They would practise, not with unreasoning prejudice in favour of this,

that, or the other forms of art, nor with the indifference of eclecticism, but with a sense of the deep significance of these forms, to whatever era they belonged, as expressions of the history of our race, and with a conviction that decorative forms in historical architecture are not mere fashions or accidents of the times, not mere independent, isolated phenomena, but symbols, slowly evolved by processes of art from certain definite conditions of human life, as links in a continuous chain of evolution, as genuine and serious manifestations of art, however rude.

Would not this larger comprehension, thus obtained, of the significance of ancient decorative forms, and this increased respect for them as means of expression, have an immediate effect upon their adjustment to modern uses, and ultimately upon the development of contemporary style? Would they not be used with more intelligence and feeling? Would not our young architects be less subject to undisciplined caprice on the one hand, or to academical prejudice on the other? Would they not become in the best sense catholic and more worthy to inherit the inexhaustible wealth of the past? Would they not, above all perhaps, be freed from the mean virtue of conformity, or archaeological accuracy, which has done more to retard the progress of architecture as a fine art than any other influence except ignorance and pretence?

There can be no doubt that, as the true basis of architectural composition of the highest sort is to proportion and to decorate structure, and that as structure is constantly developing with new methods, new devices of engineering, and new materials, the architecture of the immediate future must necessarily assume new character, at least in its outlines, supplanting to a great extent those Classic or romantic ideals or standards which Classic or romantic ideals imposed upon modern custom has arbitrarily imposed upon modern practice. Are our present methods of education preparing our young men to accept these inevitable changes without a wasteful and futile effort to effect a reconciliation between ancient academic prejudices and these new things? Will the architecture of our country in the next decade express in no doubtful terms the civilisation of America in its best estate? For this difficult task do we not need a much more scientific co-ordination of precedent, a much more philosophic analysis of the architecture of the past than is secured by our present methods of education? The question evidently is, not how are we to effect a compromise between engineering and architecture, but how are we to convert engineering into architecture; how are we to use the immense resources of beautiful precedent at our command in order to translate this prose into the poetry of a high art?

The language of form, made accessible to us by a system of study, such as we propose, would be as copious as the language of words at the command of Tennyson and Browning, of Longfellow and Lowell. The vast vocabulary of these great masters, these 'builders of the lofty rhyme,' is made up of words and phrases, derived from the entire experience of mankind, not from any special era, or from any selection approved by any school or academy of learning. They could not have expressed their inspirations with any such arbitrary or scholastic limitations of terms. The duties and the privileges of the modern architect in respect to this art are the same as those of the modern poet in respect to literature, but the prejudices of the architect's education have, by exclusions of language, apparently entirely artificial and unnecessary, embarrassed his efforts to express in terms of art, the exigencies of modern structure, material, and use. He is still trying to write new songs and sonnets and epics in classic Latin or Medieval French, and is still wondering that no one but himself comprehends or enjoys them. We are conscious that this analogy between literature and architecture must not be pushed too far, for the two arts have very different messages to deliver to the intelligence of mankind. Architecture, of course, can express conditions and thought only indirectly by symbols. But the analogy is close enough to support and illustrate our argument.

If the American Institute of Architects should succeed in persuading the schools of architecture throughout the country to teach the whole course of history by architecture, and should open to them the whole series of historic forms in the order of their evolution without prejudice, the genius of the more spacious times in which we live, which are the culmination and the result of all that has gone before, would stand a much better chance for adequate expression. Let the schools teach our young men not to conceal or disguise or condone in a mask of cold

convention, the inevitable changes of form which must come in process of time with the changes of our social and economic conditions, but to welcome them frankly and express them, with quotations from other tongues, not with affectations and pedantries of academical learning, but with the large freedom derived from a comprehensive knowledge of all that has been said in forms of art by all people.

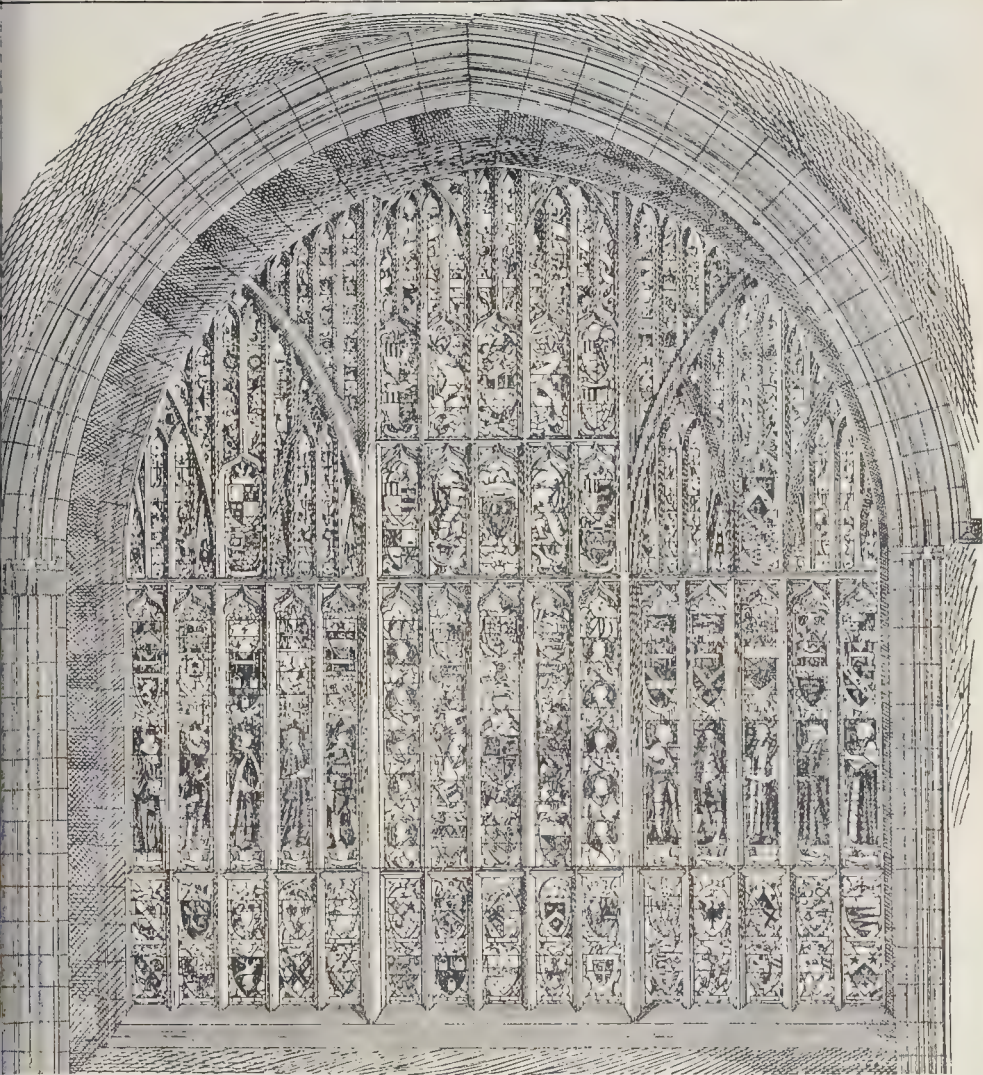
It seems to us that it is only by some process as this, that architecture as a fine art can keep pace with science. We are not proposing any such folly as the deliberate invention of a new style, or any possible amalgam of old styles; we are inquiring whether it is not practicable by an analytic study of precedent, without arbitrary preferences, to apply to the art of architecture a synthetic method of evolution. Our art should be an art of scholars and artists, not of quarians, nor of amateurs, nor of pretenses. They should be instructed and inspired by the past, not controlled by it. As viewed from a philosophical standpoint, do not our present methods, without such a comparative study of form as this, open us fairly to the charge of empiricism?

If we may not in this way accomplish a revolution in the architecture of our time (we desire a revolution, but a reform) we may at least give to the architects of the next decade a wider point of view and a far deeper understanding of their functions and responsibilities in the evolution of style, which, if it is not directed, continue to be lost in fruitless and disordered experiments.

When we see members of the Institute, at the highest available professional training, rising at the same times and in the same places, the châteaux of Francis I., town halls of Henry II., Italian villas of the cinque cento, palaces of Palladio, decorating casinos and theatres, every form of Arabian or Saracenic art, building libraries in southern Romanesque, churches like the farms of Normandy, churches of Edward IV., or St. Louis, dwelling those of every era of English history, structures in every form of the Renaissance, when we see them dissipating their forces in barren revivals, each one according to his whim, we may well doubt if this is the best use of our knowledge of precedent, the discipline of our schools produce no result than this confusion of tongues? Is it time for us to consider how we can work to effect a profitable unity of effort, each adding to the other? Does not the inevitable modern style which may be detected in all these attempts speak ancient languages, prove that character of modern style is possible, and is only restrained from its full and natural development by the judicious of our education? If the secret of progress does not lie in a more scientific thorough method of studying the successive styles and the historical conditions from which they grew, to the end that we may use them as mere imitators and revivalists, but as creators, where else shall we seek remedy?

The new type born of such a study must surely be infinitely richer, more elastic, more various than any of those which lie behind it. It must include all their virtues and none of their vices. It would substitute a true vernacular, one which is spurious and vulgar. Architecture, united upon such a type as this, would imply a uniformity, which would soon become a wearisome and monotonous. It would imply variety in unity, effective concentration of power, and such a concentration means progress and consistent progress. Such a progress of our present methods surely we are not achieving. Hitherto, it must be sadly confessed, we treated our great resources, if not like disciplined barbarians with the spoils of a certain more like the arbiters of Parisian fashion than like artists and scholars. The new method, far less pedantic, and far more cosmopolitan and generous than the old, and also far more discriminating, must teach us the real value and meaning of our inheritance, and how to work with a full appreciation of our responsibility to the civilisation of our time.

The view embodied here, as to what is just and what should be aimed at in education, history of architecture, is certainly a very old one; and perhaps it is not surprising to find it in the discussion which followed it, some regarded the tone of the Report as unduly Mr. G. B. Post thought that Mr. Van Orman's proposal would do very well in a postgraduate course which could last two or three years, but that to attempt to guide young



Heraldic Window in the new Mitchell Hall, Marischal College, Aberdeen.

teen or seventeen into a study of architectural history on this scale was an impossibility. One of the two other speakers, however, supported the spirit of the Report, urging that learners were at present taught certain styles instead of being taught a whole of architecture; and Mr. Van Brunt summed up his position briefly in the remark "in the schools of architecture the history of architecture is taught now in some form or other. I propose simply to have the history of architecture properly taught." In the end it was resolved that the Report should be forwarded to the heads of the educational institutions, for the purpose of obtaining their views on the subject.

It is worth remark, in connexion with the subject, that, while some leading English architects have recently been deprecating the study of the history of architecture altogether, as an employment of no value towards the making of modern architect, our American friends seem to be of opinion that it is a study which ought to be carried out much more thoroughly than it has hitherto been.

HERALDIC WINDOW
THE MITCHELL HALL, ABERDEEN.
 The illustration gives a sketch of the window in the east-end of the new Mitchell Hall, Marischal College, Aberdeen. The window is a

distinctly historical and heraldic one, embodying the arms of a number of personages connected with the history of the college, together with portraits of certain of them. The portraits are those of the fifth Earl of Marischal, Thomas Reid, Gilbert Burnet, James Gregory, and Dr. Arbuthnot, on the left; and on the right, Marshal Keith, Thomas Reid, James Beattie, Principal George Campbell, and Lord Monboddo. The window was designed and executed by Mr. T. Spence, of London.

THE TURNERS' COMPANY EXHIBITION.

THE twenty-sixth annual Exhibition of specimens of hand-turning in wood, instituted by the Company of Turners, is being held during the week at the Mansion House. The exhibits, on the whole, are quite equal to those of previous years; but, although the technical quality is in many cases excellent, several are examples of the application of the art to purposes to which it is manifestly unsuitable. It seems, moreover, to be accepted as an almost invariable rule that every object must be polished on completion, but many of the exhibits would look quieter and better suited to their purpose if untouched after leaving the tool, a method which

also gives more individuality and character to the work.

A ladies' work-basket in the form of a tripod, in polished wood, obtains the first prize, which goes to Mr. G. H. Alderton. The prize consists of a silver medal, the freedom of the Company and of the City of London, and five guineas. The design is pretentious and crowded with ornamentation, but well executed, a point which probably influenced the judges. The bronze medal is given to Mr. R. H. Isaacs, for a collection of square turned balusters, which are excellent in workmanship and design, and which might well have had the first prize. A "pillar-lampstand," which is awarded the third prize, seems a design quite unsuited to wood, and which, being polished, presents on that account all the more of the appearance of a design for ironwork. The spiral balusters by Mr. Alfred Miller are ingenious in their construction of different woods overlaying one another, which, however, does not strictly come within the sphere of turning. The mahogany brackets by Mr. Watson are a good example of work left unp polished from the tool.

In the class of amateurs, the Rev. C. C. Ellison obtains a first certificate of merit for a collection of small objects in ivory, beautifully executed, but much resembling the ordinary trade

exhibits in point of design. Some napkin-rings and pin-cushion holders by Mr. C. N. Pearn, in the same division, are awarded a second certificate.

The Exhibition should do much to raise the standard of mere workmanship, but the question of design seems as far behind as ever, and it is in this direction that the Company should turn its influence. We are unaware that the Company of Turners have done any service to the trade by the establishment of classes at the Trades' Training School at Great Titchfield-street; but in adopting such a course and in providing the best instructors, the Company would be furthering greatly the objects of their Guild.

A NEW ARTIFICIAL STONE.

"OWEN'S PATENT ARTIFICIAL STONE" is the name given to a new variety of building material shortly to be introduced to the market. An inspection of the process of manufacture enables us to give the following information concerning it. A mixture of 9 parts sand with 1 of lime is first of all thoroughly incorporated in the dry state in an iron cylinder, after which it is taken out and placed in moulds of the shape of the moulding, panel, or block to be made. The moulds are then transferred to another and specially-constructed cylinder, and on the latter being closed, hot water is forced in under a pressure of 50 lbs. to 60 lbs. per square inch; but, before being injected, the air is, as far as possible, abstracted. This pressure is applied for seventy hours, the temperature of the water circulating in the cylinder being kept up to near the boiling point the whole time. The box-moulds are afterwards withdrawn, and the contents allowed to dry in the air. Several kinds of sand have been adopted in the experiments carried out, and a brown, quartzose variety from the neighbourhood of Leighton Buzzard is said to answer very well. The lime employed is from Barrow-on-Soar, in Leicestershire. Judging from samples shown us at the works the artificial stone produced is of a compact nature, somewhat resembling certain calcareous sandstones. It is rather premature to speculate on the comparative durability of the material; no stone in the market is made in precisely the same manner, but a material very much like it comes here from Germany. On general grounds we should not select a natural sandstone having a calcareous matrix, on account of the liability of the latter to rapidly succumb to atmospheric influences. But with Mr. Owen's stone the matrix cannot be of the same character as that of any naturally-formed building stone, for this reason: The cementing material of a calcareous sandstone is carbonate of lime, or a double carbonate of lime and magnesia. But the lime from Barrow-on-Soar, used in the artificial stone, is not a carbonate, the carbonic acid having been driven off in the process of manufacturing the lime. What the precise effects after being subjected to the temperature and pressure in the cylinder referred to might be is very difficult to say. Thus much is certain, however, that the lime, having to be slaked under the conditions named, is rendered harder and more compact than when the slaking is carried out in the open air, and it is reasonable to suppose, therefore, that the material would be more durable than an ordinary cement or mortar block. Samples of the stone, six or seven weeks old, have been tested in Paris, and resisted a crushing strain of 3,383 lbs. per square inch, which is satisfactory. We imagine that still better results could be obtained and an improvement effected all round if a sharper and purer quartzose sand were employed. This patent stone will, no doubt, be as good as any other in the market, and the fact that it can be readily turned and has a fine surface is distinctly in its favour.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, at the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

The Water Question.—The debate on this question was resumed on the following recommendation of the Parliamentary Committee:—

"That, desiring that the supply of water in the Metropolis and the surrounding districts should be in the hands of a public authority, and with a view to a complete agreement with all parties concerned over the entire area supplied, the Council do invite Her Majesty's Government either to deal with the question themselves or to appoint a Royal Commission to do so."

Dr. Collins said that, in view of the decision arrived at last week, when the Moderate party succeeded in wrecking the Council's Water Bills, the Council had now to consider the recommendation of the Committee, which seemed to embody the view that the Council should not be the water-authority. He could not believe that the Moderate party desired to belittle the Council by proposing to set aside what might be regarded as the inalienable right of municipalities to deal with such matters. He, therefore, desired to move the following amendment:—

"That the Council having decided not to proceed with the suspended Water Bills, and desiring that the Council should be the Water Authority for London, it be referred to the Parliamentary Committee to report to the Council without delay the lines on which they suggest that the Government should be asked to legislate."

Mr. M'Kinnin Wood seconded the amendment, which, after a long debate was, on a show of hands, declared carried by a majority of 1. On a division there voted for the amendment, 65; against, 56.

Sir John Lubbock then moved that there be added:—

"That the Parliamentary Committee be instructed to print and lay before the Council the memorandum by the Deputy Chairman on the water question, with the exception of such parts, if any, as would in their opinion be prejudicial to the interests of the ratepayers."

Mr. Westacott seconded the amendment, which was agreed to without discussion. The Report of the Parliamentary Committee as amended was then agreed to.

Mr. Idris moved the reception of the Report of the Water Committee on the Welsh water areas.

Mr. Beresford Hope moved that the debate on this Report should be adjourned till the Parliamentary Committee had reported on the water policy of the Council. This was carried on a show of hands.

Charing Cross-road Subway.—On the recommendation of the Highways Committee, it was agreed that the consent of the Council be given to the removal by the Vestry of St. Martin-in-the-Fields of the subway-entrance at the St. Martin's-place end of the Charing Cross-road subway, and the formation of a new entrance; but that such consent be subject to the condition that proper communication be formed, of the full length of the grating, from the new entrance into the subway.

New Weights and Measures Office.—On the recommendation of the Public Control Committee, it was agreed:—"That, subject to an estimate being submitted to the Council by the Finance Committee, as required by the statute, an expenditure of 6,770l. be sanctioned for the erection of a Weights and Measures Office in Harrow-road; that the work be carried out without the intervention of a contractor; and that the plan and estimate be referred to the Works Committee for that purpose."

Constant Water Supply.—The following recommendation was also agreed to:—"That pursuant to Section 8 of the Metropolis Water Act, 1871, notice be served on the Chelsea Waterworks Company to give a constant supply of water on and after March 1, 1896, to a district bounded by a line starting in Victoria-street at its junction with Strutton-ground, thence along the north side of Victoria-street, The Sanctuary, and Bridge-street, to the bank of the Thames, thence along the bank of the Thames to Page-street, along Page-street, Vincent-square, Rochester-row, and Strutton-ground, to the point in Victoria-street aforesaid."

Boundary-street Improvement Scheme: Central Laundry.—The Public Health and Housing Committee recommended:—

"That, subject to an additional estimate being submitted to the Council by the Finance Committee as required by the statute, the work of erecting the central laundry in connexion with the Boundary-street improvement scheme be executed by the Council without the intervention of a contractor, and that the plans, specification, and estimate be referred to the Work Committee for that purpose; but that, in the event of that Committee not being satisfied of the sufficiency of the estimate, the Public Health and Housing Committee be authorised to invite tenders for the work."

The recommendation was ultimately agreed to.

Sanitary Staff of Rotherhithe.—The report of the same Committee contained the following paragraph:—

"Complaint having been made to the Council by the Mansion House Council on the Dwellings of the Poor as to a large number of sanitary

defects in houses in the parish of Rotherhithe inspection was made by Dr. Young, one of the Council's Assistant Medical Officers of Health, who reported that the complaint was well founded defects being discovered at no less than 502 houses. The Council arrived at the conclusion that the Vestry of Rotherhithe had made default in carrying out the provisions of the Public Health (London) Act, 1891, in their district, and a representation to that effect was, on February 18, 1895, made to the Local Government Board under Section 107 of the Act. A representative of the Board also made under Section 107 that the Vestry failed to appoint a sufficient number of sanitary inspectors. The Council subsequently informed the Board that if an inquiry were made under Section 107, it might not be necessary to proceed further in respect of the representation under Section 107. The Board, on June 6, 1895, forwarded to the Council a copy of a letter from the Vestry stating that they had appointed two honorary assistant sanitary inspectors at a salary of 3s. a week each, and intimated that by directing an inquiry with reference to the Council's representation under Section 107 of the Act the Board would be glad to receive any objections which the Council might desire to put on the Vestry's letter. The Council replied that it would prefer to reserve any further expression of opinion as to the sufficiency of the sanitary staff until the inquiry asked for had taken place. The Board thereupon in July, 1895, instructed their member, Theodore Thomson, to make an inquiry, and in a letter, dated June 7, 1895, two years later, the Board, give particulars of sanitary staff now employed by the Vestry, and that the Vestry's Medical Officer considers the staff now sufficient, and that under all the circumstances the Board think it desirable that the new arrangement should have a trial for twelve months. In the event of the protracted delay in providing an efficient administration for the Parish we regret that matter should have to remain in abeyance for twelve months. We may remind the Council that the sufficiency of the Vestry's sanitary staff was subject of an inquiry by the Home Secretary as late as 1889, when definite recommendations were made. No effect was given to these recommendations, and in 1893 the inquiry by the Council's Assistant Medical Officer, Dr. Young, showed the Vestry were still neglecting to enforce the provisions of the Public Health (London) Act, 1891. As, however, the Local Government Board is of the opinion that a trial should be given to the existing arrangements, we have adjourned the further consideration of the question for twelve months."

The Council adjourned a little before 5 o'clock.

Books.

The Law Regulating Streets and Building in the Metropolis under the London Building Acts, 1894; and other Metropolitan Statutes. By R. CUNNINGHAM GLEN, M.A., Barrister-at-Law, and ARTHUR A. BETHUNE, Barrister-at-Law. With Explanatory Diagrams. ALFRED CONDER, F.R.I.B.A. London: Knight & Co. 1895.

THIS is the largest and most important work which the new London Building Act has called forth, and appears to contain everything that can be necessary to the full understanding of the law at present controlling building in the Metropolitan area. The text of the Building Act, accompanied by long explanatory comments making clear the true force of each section, it appears to need elucidation, with reference to other portions of the Act which bear upon points mentioned in the section under notice. The other Acts, or parts of them, still in force, which bear on building operations, are given, all the Standing Orders and By-laws of the London County Council. Mr. Conder's diagrams are clear and intelligible, and the book is very thoroughly indexed. Wherever in any section a definition of the meaning of any term it would be necessary in order to understand the legal conditions of the section, or the provisions of the Act, cross-references are given to the sections in which the required definition may be found. In the case of expressions of which the legal meaning may be doubtful, as "pier," definitions are given from Gwilt's other standard works on building. The author has not attempted to elucidate the curious and old traditions in terms which occur in one or two clauses of the Act, from negligent wording, probably considering that their business was to deal with the legal provisions as they found them, and not to enter into criticisms. But, in general, it may be said that they have done all that is possible to enable every man to be his own lawyer in the interpretation of the London Building Act.

Contractors' Price-Book for 1895. By EDWARD DE VREE BUCKINGHAM. London: Biggs & Co., Salisbury-court, Fleet-street.

The first thought suggested on taking up this voluminous volume is, Why another price-book? We are not already Laxton, Lockwood, and so on? On inspection, however, we admit that a book before us sufficiently differs from others to justify its existence. Speaking generally, it is said to deal rather with engineering than with building work. Thus, some 250 pages are occupied with excavation, pile-driving, cutting, road-making, and the drainage of towns as well as houses, before we come to bricks—a point reached in most price-books twenty pages. Later on, we find coal-fits, pontoon ferry bridges, dock gates and piers, chain-cables, waterworks, and about 100 pages concerned with the construction and rolling-stock of railways and tramways. To be noted also is the unusual amount of attention paid to the important matter of contractors' plant. A novel plan adopted of numbering consecutively the items of price and lettering the notes is convenient for reference. The author has also been wisely in making his prices represent prime cost based on the London rates of wages. Some of the notes are excellent. To give a rule for finding the value per foot of brick facing is a good idea. The same cannot, however, be said of the following: "All glazed work (i.e., glazed brick facings) should be measured net, and an allowance made to suit measurements for waste cutting, according to circumstances, from 5 to 10 per cent." (p. 260). There is here a sad want of precision. "The proper allowance for waste should be calculated with little difficulty in measuring this kind of work."

As in most price-books, a great deal of space is taken up with unsuitable matter. Why insert a price-book extracts from specifications?—"Brickwork should be well flushed up every course with the trowel, and grouted every four courses to ensure stability in the work." (p. 10), far too many formulae are given; those, for example, for the rise of water caused by friction in rivers, and for the discharge of water in canals and channels, are only in place in manuals of engineering or treatises on hydraulics. The book already numbers 800 pages, and we are told in the preface that the schedules of carpenters' and joiners', plasterers', smiths', founders', and painters' work "are only in its infancy." In face of this, any suggestion for a new space should be well received.

As we have pointed out on previous occasions, a list of prices can be considered satisfactory in so far as the value of the labour and that of the material involved in any given piece of work are not arbitrarily shown. The author here crudely attempts to deal with a trade as a whole—as thus: "The proportion which labour bears to material in this schedule [masonry] may be taken as equal to 6 per cent." The only value of this is in the sense it affords that the author is alive to the consideration above mentioned. If he will lay it to heart he will double the value of his book.

Digest of the Law of Light; with an Appendix of Statutes, Forms, and Plans. By EDWARD STANLEY ROSCOE, Barrister-at-Law. Third Edition. London: Reeves & Turner, 1905.

This clear and useful little book has supplied its place in the law is shown by the fact of its having reached a third edition. The author states the heads of existing rights and liabilities in regard to light under the head of a number of short statements, "articles," in non-legal language, with references to legal authorities and precedents, and with explanations as to exceptions, or as to those requiring special elucidation. In the present edition the new decisions which have been given since the last edition have been incorporated. Those who wish to know how they stand in regard to their own or their neighbour's right of light will find the book a useful guide.

Water Supply: A Practical Handbook on the Supply of Water and Construction of Water-works for Small Country Districts. By ALLAN GREENWELL, A.M.I.C.E., and W. T. CURRY, M.I.C.E., F.G.S. London: Crosby Lockwood & Son, 1896.

This book is based on a series of articles written for the "Notes" of the authors, Mr. Greenwell, for the "Notes of the Column" of the *Builder*, from July to December, 1894, so that we can hardly review it as a separate stand-point. It has been apparently re-written and added to, to some extent,

and we believe we may conscientiously recommend it as a very useful book for those concerned in obtaining water for small districts, giving a great deal of practical information in a small compass. As the authors mention in their preface, the existing treatises on the subject are mostly of an elaborate character; and they have endeavoured to supply an elementary work such as would enable the student to acquire a knowledge of the principles and construction of waterworks, and qualify him to arrange and complete a system of waterworks, on a moderate scale, in an efficient manner, and thus lay the foundation for the experience which would qualify him to carry out larger works on the same scale.

Popular County Histories: Lancashire. By Lieut.-Colonel HENRY FISHWICK, F.S.A. London: Elliot Stock, 1894.

It must indeed be, as the author remarks in his preface, a very difficult task to condense into a moderate-sized volume for popular reading a history for which there is such a mass of information available as that of Lancashire. The result is, however, a small book with a great deal of information compressed into it, and put in a well-ordered and readable manner; and those who have an interest in Lancashire, and have not time or inclination to study county history in detail, may be recommended to avail themselves of the general sketch of the subject which Colonel Fishwick's book supplies.

The author groups his subject according to the races either of people or sovereigns who were from time to time dominant in the county; commencing with "pre-Roman Lancashire," and taking the further divisions of its history under Romans, Saxon and Dane, Normans and Plantagenets, Tudors, and "Seventeenth Century," the latter being regarded as the commencement of the modern epoch. Separate chapters are devoted to "Roman Remains," "Progress in the Eighteenth Century," and "The Dawn of the Nineteenth Century," and a miscellaneous chapter goes into a good many county traditions and legends.

The history and progress of the principal towns is specially noted from time to time, and details of cost of labour, and of the objects on which labour was employed at different periods, assist the reader to fill up in his imagination a picture of the state of the county life and civilisation at different periods. The author states that while not thinking it desirable to encumber a popular work of this kind with references to authorities, he has rejected everything which in his opinion was not capable of being well authenticated. His book gives the impression of having been written in this spirit, and besides being thus probably trustworthy as far as it goes, it is a well-written and interesting book of its kind.

The Evil Eye: An Account of an Ancient and Widespread Superstition. By FREDERICK THOMAS ELWORTHY. London: John Murray, 1895.

This book is a collection of very curious lore, the result evidently of a good deal of study in regard to the manifold forms of the superstition which regards some persons, actions, or substances, as of evil omen and mischievous to those subjected to them. There is a good deal of interest in it, but the only way in which it bears on our province of investigation is in so far as it furnishes the real meaning of some forms and details in archaic art, especially in the emblems and attributes assigned to some figures of deities. The author has traced out some connexions between things not generally supposed to be connected; and it may surprise the reader to be told, and to find it argued with great probability, that the horns or antlers of an animal, which form a fashionable ornament in the hall of a country house, were originally placed there to avert malevolent influences; that they are connected with the cult of the horned Isis and Diana; that among the less educated Italians at the present day a horn is one of the most sovereign specifics against the evil-eye, and the mere uttering of the word *cornu* or *cornea* is a protection; that the horse-shoe nailed on the cottage-door is another form of the same emblem, with the additional power in it arising from the fact that witches and evil spirits of all kinds have an unconquerable aversion to iron. Possibly this latter superstition is a remnant from the far-off days of pre-historic man, to whom iron was a new wonder discovered in his universe, and one of great and mystical signification. Oddly enough, some peoples and tribes have, on the other hand, an aversion to, or some kind of

superstitious fear of, iron; the negroes of the Gold Coast remove all metal from their persons when they consult their fetish; and the author connects with this superstition the fact that the wooden bishop's throne at Exeter Cathedral is "constructed entirely without nails or iron of any kind;" but here we think his fancy has run away with him, and that the avoidance of iron in this case was dictated by much more practical considerations. We cannot go further into the subject here, but may recommend the book as an interesting account of a very curious phase in human superstition, and which has not been without its influence on ancient art.

Three Months in the Forests of France: a Pilgrimage in Search of Vestiges of the Irish Saints in France. By MARGARET STOKES. London: Geo. Bell & Sons, 1895.

We have mentioned a previous work by Miss Stokes, the main object of which was the same as the present one, viz., to find out traces on the Continent of Irish saints and their apostolic work, but at the same time to notice some of the bearings of the inquiry on Irish architecture and art and their connexion with foreign countries. Miss Stokes's former volume was concerned with traces of Irish saints in Italy; the present one is concerned with traces of Irish saints, especially St. Fursa, in France.

It is mainly a book for those interested in ecclesiastical history and legend; but Miss Stokes's inquiries have brought her into contact with some interesting architectural monuments in out-of-the-way parts of France, and as the book is well illustrated, it may suggest for the architectural reader some new points of interest.

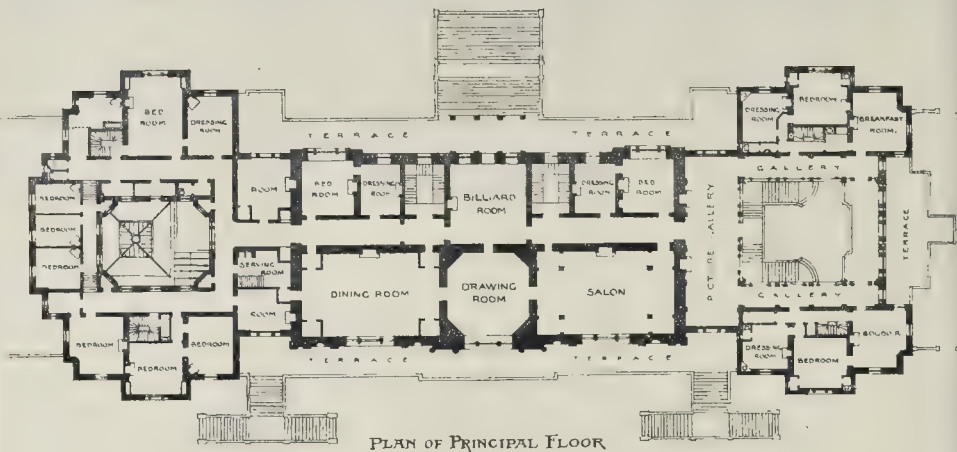
St. Fursa became the patron saint of Péronne, and there is a chapel to him in the church of St. Jean in that town, of which some illustrations are given. The author also looked for traces of St. Fursa in Suffolk, and in regard to this part of the subject there is, perhaps, some ground for her remark that the English antiquaries of the day, with some exceptions, "devote their energies too exclusively to the Roman remains found in England, ignoring the far deeper interest of their own native traces of early history."

Bye-way History; or, Short Studies of Out-of-the-Way Places. No. 1. Blethingley. No. 2. Praxtote. By J. TAVERNOR PERRY. London: B. T. Batsford (in progress).

These appear to be the first two of a series of small illustrated pamphlets on out-of-the-way places which possess architectural and archaeological interest. The first examples give us every reason to hope that the series will be continued. They put together, in about thirty pages each, information about places which few persons know anything about, but which are worth attention. The pamphlets are illustrated with a number of small but excellent sketches.

TRADE CATALOGUES, &c.

MESSRS. J. SAGAR & CO. send us their catalogue of wood-working machinery, one of the most fully-got-up catalogues we have ever seen, containing admirably-executed engravings of the many varieties of complicated machines made by this firm for wood-working, with description on the opposite page, the whole printed and got up with the highest finish. Among the machines illustrated may be mentioned the balancing machine for balancing moulding and revolving cutters, so that they may not only be of equal weight generally, but have the weight equally distributed in their substance—an important requirement for clean and steady working. The accurate balancing of working parts is a point which, we are told, receives special attention in Messrs. Sagar & Co.'s machines. Other illustrations include a type of horizontal engine, specially made for driving wood-working and saw machinery, with a variable cut-off governor to secure regularity of speed under varying loads, and proportion the supply of steam to the work being done; various saw-benches; combination machine for joiners' work; rope-feed and roller-feed circular-saw benches; the dimension sawing-machine for sawing to accurate dimensions with or across the grain; a large variety of machines for heavy sawing work; the colonial log frame, for use in the colonies for opening out logs; Wright's patent band-saw guide, in which contact with the saw is taken by a rotating disc, so that there is no friction or heat; combined band and circular saws; the cheap and convenient

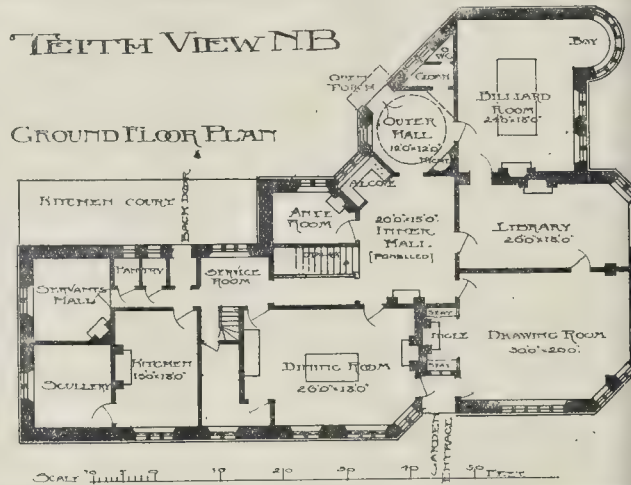


Plan of Gosford House, showing in the right wing the Plan of staircase illustrated in lithograph.

pillar band-sawing machine; a number of patents of band-sawing machines of more elaborate kind for heavier work; fret-saw machines; planing and shaping machines; mortising, tenoning, and boring machines, &c. In addition to the description of each machine and its special duty, is a small table at the foot of the page giving the principal statistics of the machine; as, in the case of a planing machine: "Width will plane, 12 in.; diameter of pulleys on countershaft, 8 in.; revolutions per minute of countershaft, 800; approx. nominal H.P. required, 1½," these being arranged in tabular form, with the code word for the machine added. The catalogue is indexed, and a list is given of telegraphic code sentences in use by the firm. With its illustrations and descriptions the catalogue makes quite an interesting compendium of information as to wood-working machinery, and may be studied with advantage even by those who have no commercial use to make of it.—Messrs. Macdowell Steven & Co. (London) send us their new illustrated catalogue of register-stoves, tile-stoves, tile panels and hearths, chimney-pieces, &c. Among the grates the "Radiant Grate" is well contrived for making the most of the heating power and avoiding down-draughts. The fault of nearly all the patterns of ornamental iron grates, mantels, and over-mantels is over-ornamentation. The simpler designs are the best, but there are not many of them. We presume there must be a demand for this kind of over-ornamented cast-iron work, or manufacturers would not go on producing and illustrating it; but it is a complete mistake from the architect's point of view, and if manufacturers would get more designs of a less pretentious kind, made by those who know how to design for cast-iron, they would probably find their account in it in the long run. The wood-mantel fire-places are much better in appearance, and many of the designs, shown in photographs, are in good taste and very pleasing. The coloured tiles illustrated also include some very pretty work. On the other hand, the designs in elevation for marble chimney-pieces are as poor as they can be; they represent the taste of thirty years ago, when taste in this kind of thing was at its lowest ebb, and one must feel surprised that any large firm at the present day should not at least be better informed than to offer such designs as these to the public.—Mr. Edward Wood (Manchester) sends a useful catalogue of constructional steel and iron-work, consisting of sections of roofs, elevations of bridges, steel stanchions, sections of iron and concrete fireproof flooring; rivet-girders, fireproof structures, iron staircases, &c.—Messrs. Keeling, Teale, & Co. (London) send us their catalogue of "artistic hammered iron," consisting mainly of lamps, brackets, and fire-irons. The drawings are not very good, and perhaps do not do justice to the real appearance of the articles, as the engraved ones mostly produce a better impression than those shown in the lithographed drawings. The work appears up to a fair standard in general style,

TEITH VIEW NB

GROUND FLOOR PLAN



though it is hardly what would pass for artistic design in the more specialised sense.—Messrs. Bourne & Grove (Worcester) send a catalogue of mouldings and joinery work, containing a variety of useful sections of mouldings; of the designs of other work the less said the better, except some of the turned balusters, of which some are good patterns and would look well in execution—Nos. 4, 5, 6, 16, 17, and 22, for instance.—Messrs. Dorman Long & Co. (Middlesbrough) send a very businesslike catalogue of sections of steel girders, with detailed information as to weight, coefficients of stress, dimensions of every portion, lengths kept in stock, &c. Three different factors of safety are given, representing 10/6, 8, and 6¼ tons tensional strain per square inch of section, or practically one-third, one-fourth, and one-fifth of breaking strain. Some useful suggestions are made as to the construction of steel-joint floors. The steel is all made by the "Siemens-Martin Open Hearth Acid Process."—Messrs. Measures Bros. (London) send a small pocket catalogue of sizes and sections of steel girders, with sizes and estimated strengths for various bearings; the catalogue also includes plate-iron and angle-iron, statistics as to breaking and crushing loads, and as to weights per foot of angle and tee-steel and round and square iron.—The "Art Memorial Company" (London and Beckenham) send a book of photographs of marble monuments which have been carried out by them, which show an endeavour to produce a correct style of work in

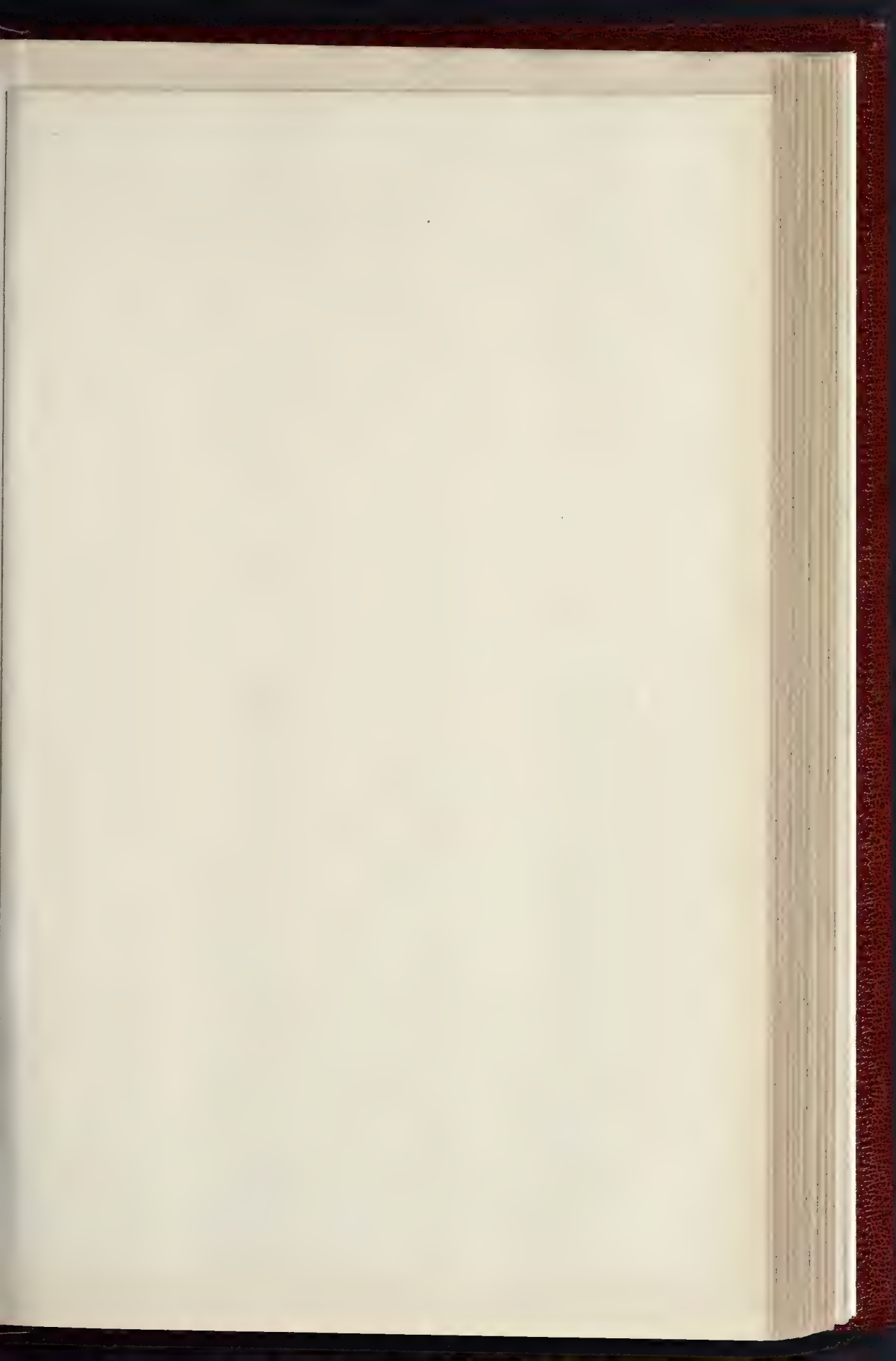
marble monumental erections of an architectural kind; they are fairly good, but some of the Gothic examples are rather overdone with carving. The Classic ones are the best.

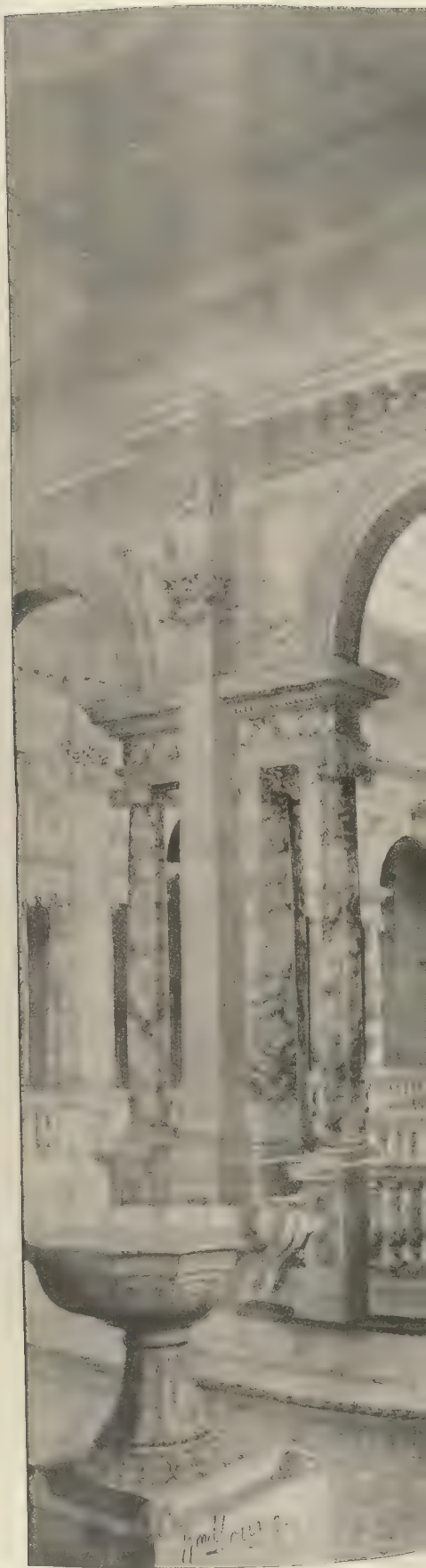
Illustrations.

GOSFORD HOUSE.

OUR illustration, taken from a drawing of this year's Royal Academy Exhibition, gives a view of the staircase hall of Gosford House, the Earl of Wemyss' residence on the Firth of Forth. The pilasters, cornices and arches are of Caen stone; the columns, panels, and balusters are alabaster. The builders' work was done by Messrs. J. Kirkwood, of Edinburgh; the steel door and roof by Sir W. Arrol & Co., of Glasgow; the stone and marble work by Messrs. Farnham, of London; and the canvas and ceilings by Messrs. G. Jackson & Sons, Rathbone-place. Mr. William Young is architect.

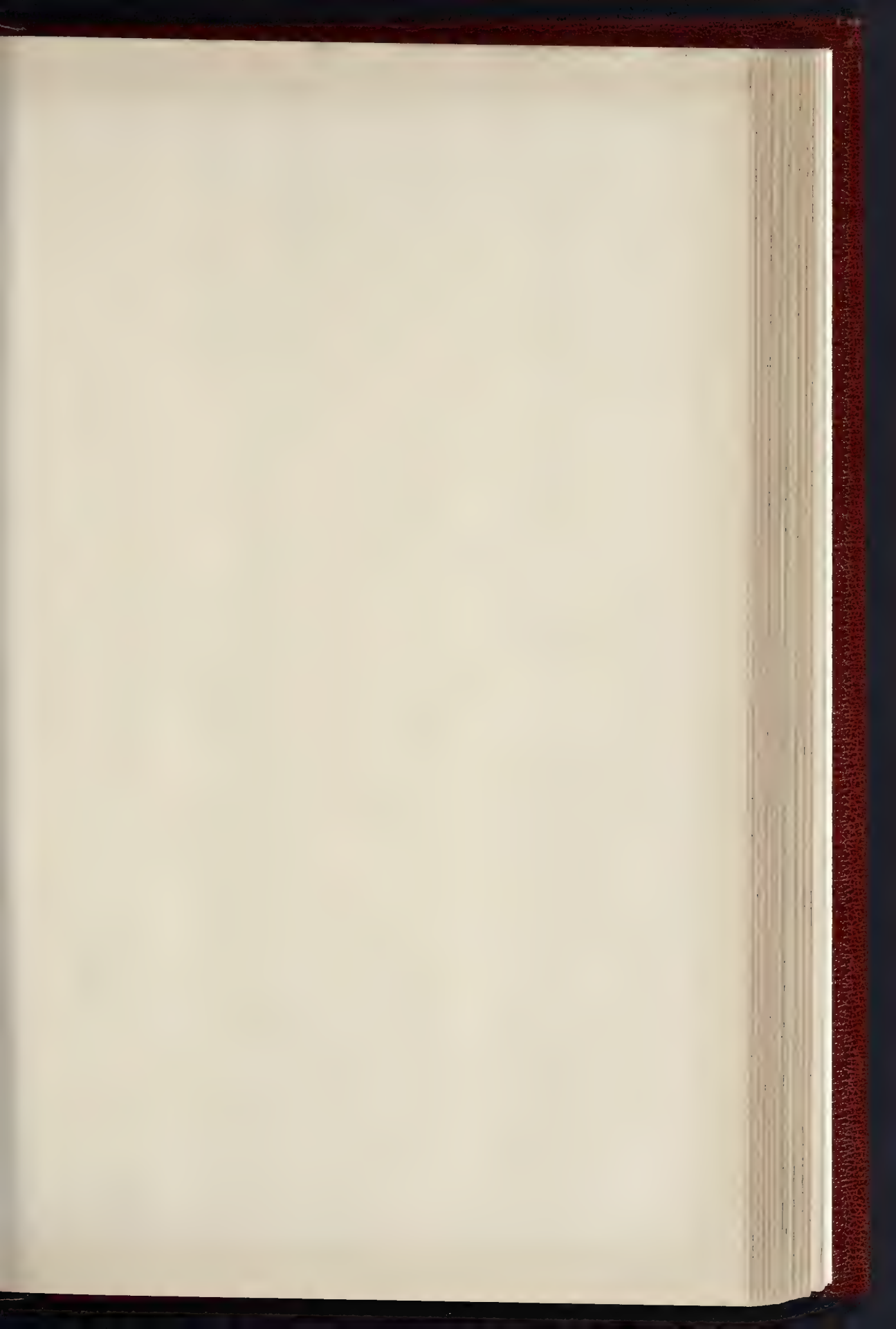
"TEITH VIEW," DOUNE, N.B. This house was designed to suit a peculiar bend of the Teith, having very fine view one direction only. The house was accordingly placed angle on to the view, and as many as possible planned to command it; the principal entrance and offices being behind.

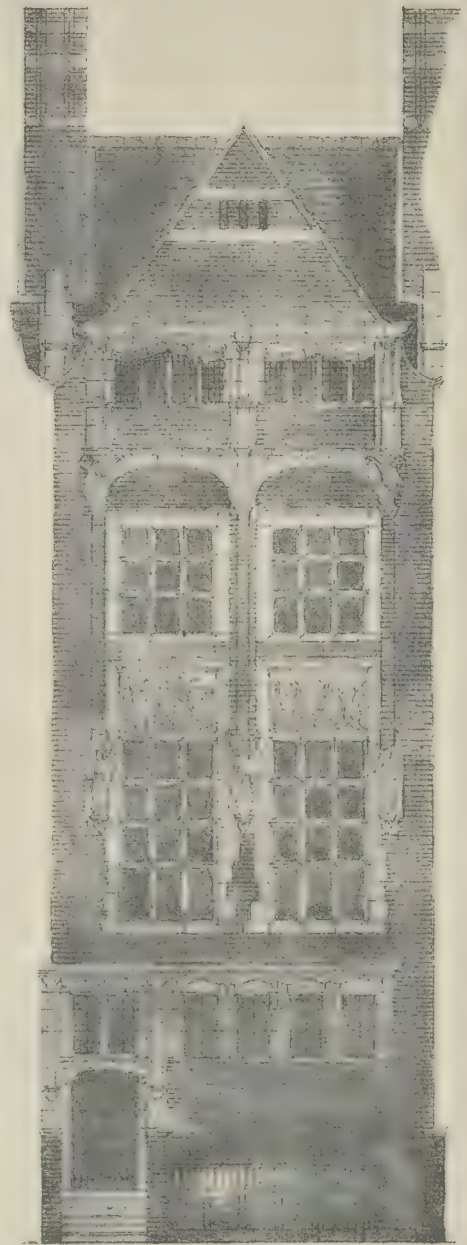
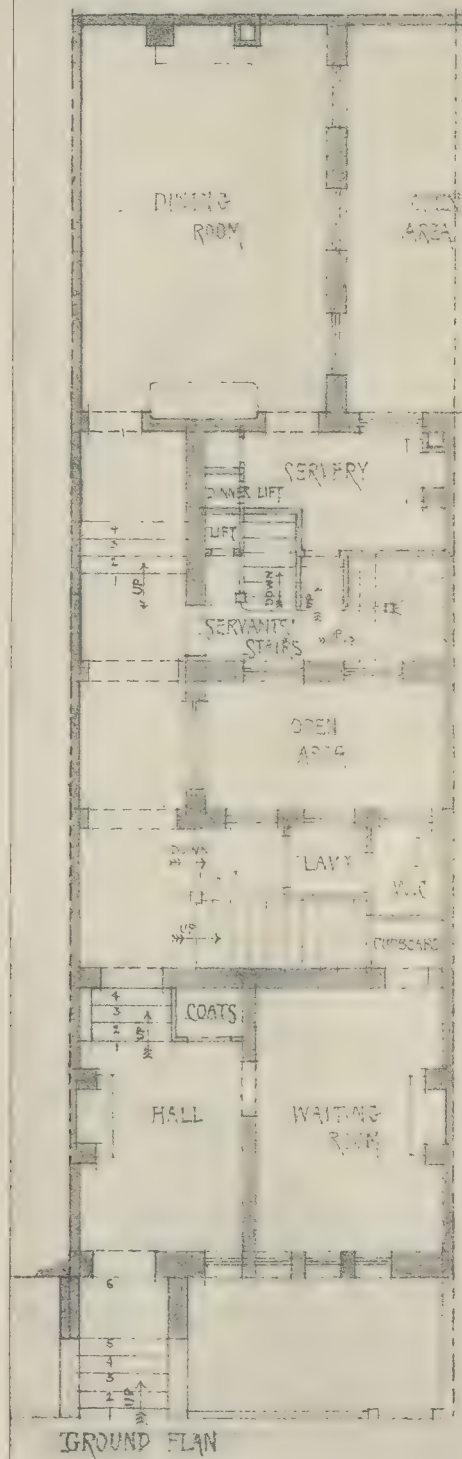




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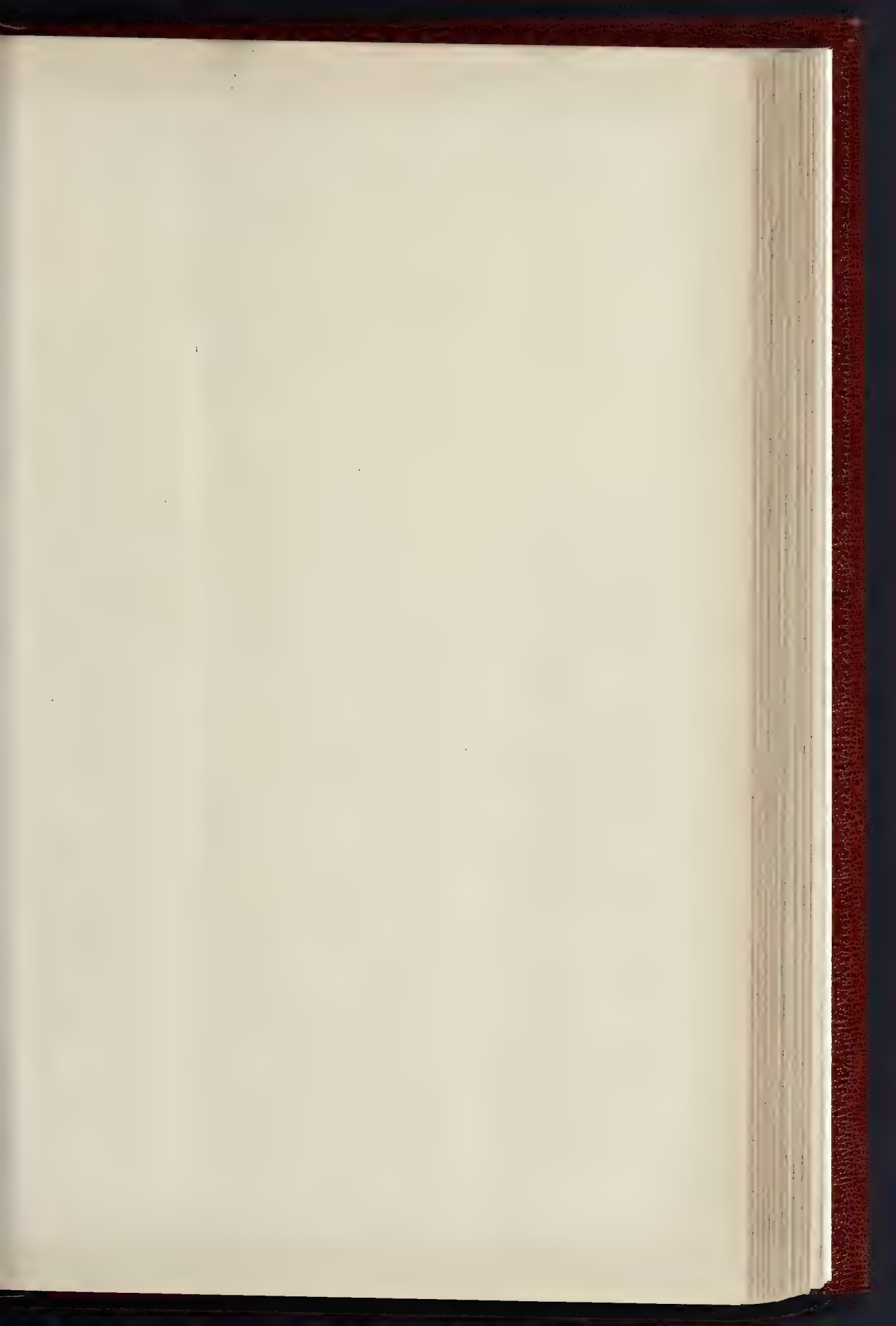






A SMALL TOWN HOUSE

Designed by F. J. Cooper
(initials)



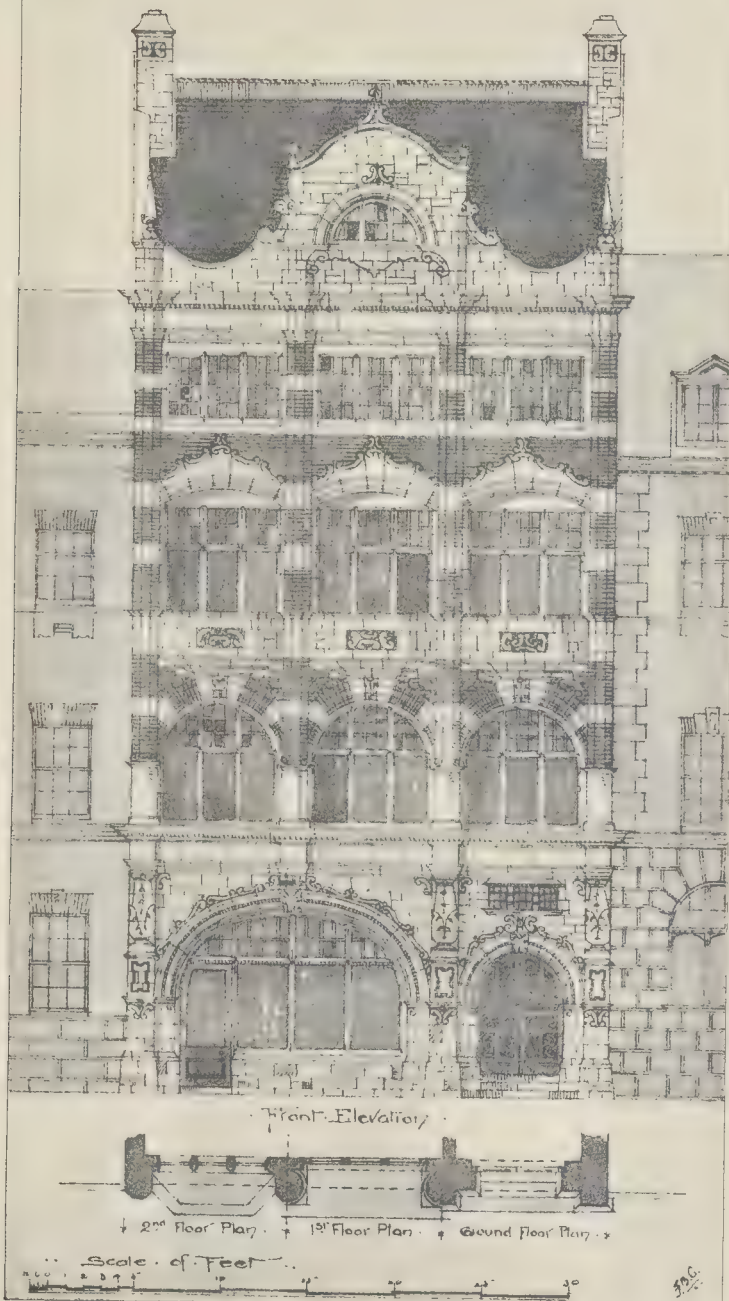


"TEITH VIEW," NEAR DOUNE



PHOTO LITHO. SYRACUSE & CO. 44 & 45 EAST MADISON STREET, PETERB. JUNE 1895

• Proposed •
 • Business Premises •
 • Frank B. Cooper •
 • Architect. • 1894 •





Church at Repton, Derbyshire; showing square-ended Saxon chancel, as mentioned in Professor Baldwin Brown's first Paper on "Pre-Conquest Architecture" (page 217 ante). From a Photograph. (See also pages 288-9 in present issue.)

The stone is a rough local sandstone, the slates berthwaite green. The architects are Messrs. Niven & Wigglesworth, and the drawing was exhibited at the Royal Academy of this year.

A SMALL TOWN HOUSE.

This design does not need much explanation, it might be pointed out that my endeavour is to express as far as possible the internal arrangement on the elevation. Thus, I think it would be readily inferred that the windows on first floor belong to the drawing-room, and that the front portion of the ground story is subsidiary to the family apartments. I may mention that there is no other room on drawing-room level, the remainder of the first floor (consisting of bedroom, bath-room, and study *en suite*), being reached by a short flight of steps corresponding with that in the ground floor corridor.

HERBERT F. T. COOPER.

PROPOSED BUSINESS PREMISES.

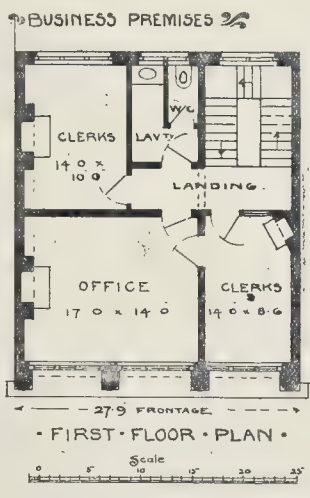
This is a sketch for proposed business premises, Mr. Frank B. Cooper. The upper part of the building is devoted to suites of offices, the ground floor being taken up with a shop. The materials proposed to be used are Portland stone and red bricks. The drawing was exhibited at the Royal Academy in 1894.

CHURCH AT REPTON.

The accompanying reproduction from a photograph represents the present condition of Repton Church, one of the churches, originally Saxon, referred to in Professor Baldwin Brown's articles "Pre-Conquest Architecture" now appearing in these columns. It shows the Saxon (or "Pre-Conquest") masonry with the late Gothic window inserted in it.

ARCHITECTURAL SOCIETIES.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.—The first general meeting (ordinary) of the Session 1895-96 of this Institute will be held on November 4, when Mr. Francis C. Penrose,



F.R.S., President, will deliver the opening address of the Session.

NORTHERN ARCHITECTURAL ASSOCIATION.—On Saturday last about thirty members of the Northern Architectural Association met at Monkwearmouth Station and drove thence in brakes to Monkwearmouth Church. Visits were also made to the Chester-road Board Schools, St. Hilda's Church, and St. Ignatius' Church (the gift of Bishop Lightfoot), where the Vicar showed and explained the new reredos to those present.

CONSERVATIVE CLUB, CARDIFF.—New premises for the Conservative Club at Cardiff were opened on the 16th inst. The contractor for the building has been Mr. James Allan, while the architects were Messrs. J. P. Jones, Richards, & Budgen.

The Student's Column.

METALS USED IN BUILDING.—XVII.

COPPER ALLOYS (continued).

Bronze.

THIS is an alloy of copper and tin in variable proportions, with other metals such as zinc, lead, and silver in minor degree. The last-mentioned ingredients, however, should never be present in sufficient quantity to materially affect the character of the alloy as a more or less pure admixture of copper and tin. When they are, and the general character of the substance is altered, it is usual either to qualify the term bronze, or to use an entirely different name. We will first of all describe bronze as commonly understood, and then refer to its varieties. The average composition of true bronze is fixed at about nine parts copper to one of tin, though this standard is frequently not adhered to at the present time.

Bronze has been in use since pre-historic times; it was probably introduced into Europe either from Asia or from Egypt. The ancient Egyptians were specially adept in its manufacture, as is evidenced by numerous bronze instruments and other articles found in tombs. With the ancient Greeks and Romans it was known as χαλκός, or *aes*, synonymous terms, which also applied to brass and pure copper. It is almost impossible, from the last-mentioned circumstance, for us to be certain which of the three metals, bronze, brass, or copper, ancient writers were referring to on specific occasions. Bronze weapons and other objects were in use by primitive man in Britain, and in general the employment of the metal in north-western Europe dates from pre-historic times. It should be remarked, however, that what is commonly known as the "bronze age" differed in its epoch in various parts of the world. It is quite certain that whilst one "nation" was in its "stone age," others were in their "bronze age," and so on—so that the term is only relative, and does not refer to a fixed epoch. It is reasonable to assume that bronze has evolved from the use of copper; the latter metal was found too soft or too malleable to be of the greatest service in making weapons, and it was ascertained that the addition of a small quantity of tin wonderfully increased its hardness and usefulness. Notwithstanding the peculiar adaptability of copper for making utensils and beaten work, we find that on the whole bronze was preferred. Not so, however, during the "Gothic" period of the twelfth, thirteenth, fourteenth, and fifteenth centuries, when bronze and bell-metal, as well as "latten," or "electrum," were not less known; for the majority of the admirably-wrought objects for church use, such as reliquaries and mountings were of nearly pure copper.

Again, during the Renaissance, and subsequent period of decline, copper in beaten work was much used in buildings; as also for works of sculpture in low and high relief, and for the formation of figures on a solid core. But we are anticipating slightly.

To return to the varieties of ancient bronze, it may be said that many were used by ancient sculptors and founders, and several have curious histories. The *Aes Corinthium*, for instance, is stated to have been accidentally formed during the burning of Corinth by Lucius Mummius (B.C. 146), by the fusion of various metals, chiefly bronze, but intermingled with silver and gold. This mythological history of the metal is regarded as extremely improbable, however, in view of recent research, and Corinth bronze was in all likelihood the outcome of experiments on well-proportioned mixtures of metals prior to the burning of the city alluded to. Pliny has, of course, left us some particulars concerning the bronze of sculptors, but he does not appear to have had the entire confidence of metallurgists of his day who (like those of more modern times) evidently dealt in secrets. The composition of certain bronzes given by Pliny are consequently of an impossible character. That fact does not altogether impair his description of the metal, and we learn that there were three distinct varieties of Corinthian bronze. The two most important were the white (*candidum*), so-called from the high proportion of silver in its composition; and the golden, the exact composition of which is doubtful. The *hepatron* was a reddish-chocolate coloured variety of bronze, most probably free from zinc, and contained a smaller proportion of tin than the varieties of Corinthian bronze. The liver-colour of its exterior was no doubt the result of some

secret "pickle." Probably no kind of bronze was in higher repute in ancient times than the *Aes Deliacum* from the Island of Delos.* Artists and those requiring work in bronze flocked to the island from all countries. Myron was the great patron of the Delian alloy, which nowadays is regarded as being too high in tone. The bronze made at Ægina rivalled that of Delos, and was adopted by Polykleitos for his works in metal.

The composition of bronze in use during the Byzantine period must have varied considerably, judging from the different colours of the metal handed down to us. According to Theophilus zinc was largely employed in the bronzes of the eleventh century. In the earlier period of the Renaissance artists were commonly their own founders, hence the bronze used was mostly of good quality—there was no disposition on the part of the "manufacturer" to cheapen the metal by mixing it with an inferior alloy, the sole object, so far as the casting was concerned, was to produce a sound piece of work, with a rich even surface.

It is a remarkable fact, that in spite of the great attention given in recent years to copper-tin alloys, none give greater strength nor a keener cutting edge than those of similar composition to the bronze used by the Greeks and Romans for specific purposes. The result was and is brought about by hammering, as well as hardening the metal by heating and slowly cooling it. All copper-tin alloys may be made to take a high polish, when they possess a somewhat waxen-metallic lustre, and fuse at moderate temperatures. Mr. Hiorns, in his "Mixed Metals," p. 158, remarks that the great feature of modern bronzes is the substitution of triple and quadruple alloys for the old dual alloys. French bronzes nearly always contain the metals copper, tin, lead, and zinc, and occasionally small quantities of nickel, arsenic, antimony, and sulphur. Zinc used in small quantity in bronze is beneficial, as in casting the metal runs thinner and is freer from blow-holes; if too much of that metal be added, however, the result is the production of a species of brass rich in tin. From that circumstance the proportion of zinc should not exceed 2 per cent., when great tenacity and elasticity are desired as important factors in the alloy. A small quantity of lead added to bronze makes the latter slightly more malleable, but it does not usually mix well. Iron is useful in bronze alloys where the prime object is to increase the resistance of the metal to wear and tear, as for certain machinery purposes.

Aluminium Bronze.—This is a variable alloy of copper and aluminium, but the proportion of the latter metal may not exceed 60 per cent. nor fall below 30 per cent., as hardness, brittleness, and a crystalline structure are then set up. Notwithstanding this, however, the proportion commonly used is about 10 per cent. aluminium. For large castings French metallurgists frequently employ only about 2 to 3 per cent. aluminium. It has been known for many years that by their union these metals mutually harden each other, for just as copper increases the hardness of aluminium, so aluminium in small proportions increases the hardness of copper. The 10 per cent. aluminium alloy is usually regarded as the most useful for commercial purposes. Mr. Hiorns remarks that it is very hard, can be beaten when cold, but better still when hot, and may, in these physical properties, be fitly compared with iron; it is also very ductile. Its general chemical behaviour differs but little from other important alloys of copper; however, it has been found to resist sea-water and sulphuretted-hydrogen better than most of them. Its tenacity is equivalent to that of steel, and the metal has special use for journal boxes.

It is almost universally laid down that in the manufacture of aluminium bronze a very pure copper must be used; hence scrap cannot be advantageously employed. Mr. R. L. Packard reports that great tensile strength resulted from the admixture, by American manufacturers, of 10 per cent. aluminium with 90 of pure copper; and it is especially suitable for bronze ornament and decoration in buildings, being practically non-corroding. The soldering of copper-aluminium alloys, especially where a large percentage (say 10 per cent.) of the last-mentioned metal is present, is not an easy matter. Up to 5 per cent. it may be readily soft-soldered with ordinary tin solder; when the proportion of aluminium is much increased the alloy has to be coated with copper at the points to be united. Hard soldering, naturally, does not present such difficulties, and the union may be readily effected by a metal

composed of 52 parts copper, 46 parts zinc, and 2 parts tin, assisted by borax. Tests of joints made with this solder at Neuhausen showed that aluminium bronze plates butted together gave a resistance to pulling strain of 26 to 28 kilograms per square mm., and lapped joints (5 mm. lap) required 39 kilograms per square mm. to part them. Aluminium bronze castings may be united by the process known to foundrymen as sweating, or burning. Aluminium bronze in the proportion of 9 parts copper to 1 of aluminium closely resembles gold in external appearance, but is much harder and lighter. As may readily be anticipated, it has its uses as an imitation of gold, though it becomes much tarnished in course of time.

Phosphor Bronze.—It was discovered in 1853 that by adding phosphorus to an alloy of copper and tin in the molten condition the physical properties of the bronze were much improved, and the resulting metal is known as phosphor bronze. The function of the phosphorus is not so much that of an alloy as a refiner of the metal, and it is remarkable that even the merest trace is often sufficient to effect the desired improvement. The fact is, that phosphorus has a strong affinity for oxygen, so that when introduced in suitable form to metallic oxides, such as tin or copper, it reduces them, forming oxide of phosphorus. An alloy of 5 per cent. tin, 1 per cent. phosphorus, the remainder being copper, is recommended for rolling purposes, or for drawing into wire and rods; but for ornamental castings, steam and boiler fittings, &c., the tin rises to 7 per cent., and the phosphorus up to 25 per cent., an alloy much tougher and stronger than the preceding. Where phosphor bronze of great hardness or strength is required, tin may be present to the extent of 9 per cent. and phosphorus 1 per cent. By the addition of more phosphorus the alloy may be made nearly as hard as steel, but that is at the expense of malleability and toughness. With more than 4 per cent. of phosphorus, however, the metal is rendered useless—it may be regarded as a mass of crystallised phosphor tin with copper. Phosphor bronze of the higher grade is used in the building arts, but more particularly in connexion with machinery.

GENERAL BUILDING NEWS.

REBUILDING OF SWANSEA PARISH CHURCH.—On Tuesday last week a meeting of the Rebuilding Committee of the Swansea Parish Church was held at the National Schools, Oxford-street. The plans previously prepared by Sir Arthur Blomfield were subsequently discussed, and eventually it was decided that the architect referred to should prepare working plans to be submitted to a future meeting for adoption, after which tenders will be invited for carrying-out the work. It is not expected, however, that the work will be proceeded with before the New Year. The whole scheme will cost 24,000*l.*

ABERDEEN UNIVERSITY EXTENSIONS.—An extensive scheme of enlargement of the Aberdeen University has been inaugurated this week. The foundation was founded 400 years ago, but the quadraterenary will not be celebrated till all the buildings are completed. Through the munificence of the late Dr. C. Mitchell a new graduation hall and tower have been included in the scheme, and are to be called the Mitchell Hall and the Mitchell Tower. Two of the departments included in the extension scheme, anatomy and surgery, are also finished, and have been opened this week, but other buildings which comprise the extension are far from complete, and may not be finished for years. Entering by the door in the centre of the quadrangle under the Mitchell Tower is the old staircase, which leads to the former hall of Marischal College, now transformed into a picture-gallery. This room forms an approach to the great Mitchell Hall beyond. The new hall measures 116 ft. by 40 ft., and 42 ft. high, the long vista of nearly 300 ft. produced by the two halls and staircase having a striking effect. At the east end of the hall there is a large window filled with Perpendicular tracery. This window fills the entire end of the apse, and measures 28 ft. wide by 32 ft. high. Dr. Mitchell caused it to be filled with stained glass representing, by means of heraldry as well as figure subjects, the history of Marischal College. The glass of the window was designed and executed by Mr. Spence, London, assisted in the heraldic scheme by Mr. P. J. Anderson, University Librarian. In addition to the large east window, the hall is provided with ten side windows, five in each side, filled with granite tracery and stained glass, with heraldic devices representing the history of King's College. The walls are built of granite ashlar, the inside surface being dull-polished and set in gilt pointing. The granite used for the interior is from the Corenne Quarries. The mouldings at the windows and arches, also of granite, and the shafts of the pillars, both of the pillars and the piers between the windows, are of

polished red granite. The lower part of the wall up to the height of fifteen feet, is paneled in oak and the flooring is laid with oak and walnut parquet. The roof is also of oak, arched, and richly ribbed and bossed. There are upwards of two hundred carved oak bosses at the intersection of the ribs, and each boss is fitted with electric lamp. Along the centre of the ceiling is fixed a series of shields emblazoned with devices representing benefactors of the University; these are left blank for future benefactors. There is a small gallery round three sides of the hall, the front of which is carved in oak. The gallery is projected from the wall without pillars, and forms a canopy over the sofa seats, which are ranged out on both sides of the hall. The west gallery accommodates a large organ, made by the Electric Organ Company, Birkenhead, upon their new system, driven by electricity. The archway between the two halls is to be draped with painted tapestry. Besides the electric light on the ceiling, there are to be lights grouped around the capitals of each of the ten side pillars. The hall will accommodate 1,200 seated. The Mitchell Tower, which is finished, is in granite. It measures 39 ft. 6 in. each face, and from the level of the upper quadrangle it rises to the height of 230 ft., and 250 ft. from the lower. Four octagon turrets rise to the top at each of the four corners, each terminating in a tier of crocketed pinnacles, the upper circle round the tapered points, being also richly crocketed. In the centre of this group of four turrets, a central tower or pinnacle rises. This pinnacle is also constructed of granite, and is carried up from the foundation in the centre of the tower. It accommodates the staircase, and at its top is a look-out of the clockwork. The quadrangle is 54 ft. in diameter, and illuminated. A striking bell weighs 34 cwt., and was supplied Messrs. Evans, of Birmingham. The four sides of the tower are pierced by three windows of large dimensions, filled with Perpendicular tracery. The floor under the hall, on the level of the quadrangle, is a series of rooms for the accommodation of the Students' Union. Entering under piazza at the north side of the tower, a corridor leads to a cloak-room; dining hall, 55 ft. 25 ft.; luncheon buffet; behind which are situated two stewards' rooms for service; and above, in intermediate floor, is a dwelling-house for a steward. Beyond the buffet, containing the Students' Union, is a billiard and smoking room; the Students' Representative Council room; and the extreme east end a large hall with gallery three sides, provided with a stage for dramatic musical performances, and division lobbies at each side on the model of the House of Commons. This room measures 40 ft. by 60 and 20 ft. high, and is intended to serve the purposes of a reading-room and news-room as well as a concert room and debating hall. The floor of the Students' Union is of pitch-pine. The windows are glazed with cathedral-glass and lead quarrs. All the rooms are heated and supplied with fresh air by means of Key's system of mechanical ventilation. On the floor under the Students' Union, on a level with the lower quadrangle, is a new anatomy department. The dissecting-room measures 75 ft. by 53 ft., and 25 ft. high. The walls from floor to ceiling are lined with ivory-coloured glazed tiles. The floor is oak on the block-floor system. The surgery department, which is a finished and ready for use, consists of a lecture theatre, 28 ft. by 32 ft.; practical room, 28 ft. by 32 ft.; preparation and instrument room, diagram-room, and professors' rooms. The room is lighted from the roof, and, like the other departments, is ventilated and warmed on the mechanical system, and fitted with electric light. Adjoining the dissecting-room a laboratory, 40 ft. wide by 50 ft. long; a small one separated by means of a revolving partition. Professor's private laboratory, and Professor's room, a lecture-room, 40 ft. by 35 ft.; and museum, 44 ft. by 30 ft. In addition to these there is an anthropological museum. There are three large departments far advanced. When these are finished, the whole of one side of the quadrangle will be complete as far as the present scheme goes, leaving the opposite side of the quadrangle still to be dealt with. The cost of the whole works as already commenced, is 104,225*l.* The whole of the architectural work in connexion with the enlargement and remodelling of the buildings has been carried out by Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen. The contractors for the work in connexion with the erection and decoration of the hall were—Messrs. John Morgan; carpenters, Messrs. Watt, Clark; slaters, Messrs. James Stephen & Sons; plumbers, Messrs. John Blake & Sons; painters, Mr. John Whyte; electric-lighting, Messrs. Shinn, Laing, & Co.; ventilating machinery, Mr. Keir, Glasgow.

WELSH CHURCH, TREORHY.—The new Welsh church, which has been erected in Treorhy, a village which will in future be known as St. Tydfodwg, was opened on Monday. The church is built of local stone, with brick dressing. The structure will accommodate about 400 persons, and measures 80 ft. by 32 ft., being covered by a one-span roof. The interior consists of a roof of red pine and stuccoed walls. The windows are tinted with cathedral glass. The seats are made of varnished deal. The church is warmed by two

* See "Bronzes," by C. Drury E. Fortnum, 1877, p. 11.

† "Mineral Resources of the U.S. for 1886" (1887), p. 221.

lugsroove hot-air stoves. The entire cost will be about 1,600*l*. Mr. Jacob Rees, Pentre, was the architect, and the contract was satisfactorily carried out by Messrs. Edward Davies & Sons, Treherbert.

CHURCH, CARDIFF.—The memorial-stone of a permanent church in Wells-street, Riverside, Cardiff, in connexion with the Christ Church Mission, has just been laid. Mr. J. Styles is the builder, the architect being Messrs. F. Waring & Son. The structure will be of Newbridge stone, with Bath one facings, and the style of building will be Gothic.

SCHOOLS, PENZANCE.—The Penzance Wesleyan Day Schools have just been reopened after enlargement. The plans were by Mr. J. W. Tronson, Mr. W. H. Tronson was carpenter, and Messrs. Alfred & William Trybail were the masons.

SANITARY CONVENIENCE, SHOREDITCH.—An underground sanitary convenience and lavatory, Shoreditch High-street (between Commercial-road and Great Eastern-street), was opened on the 1st inst. by the Chairman of the Vestry of the parish of St. Leonard, Shoreditch. The convenience is for both sexes, and has been constructed at a total net cost of about 1,800*l*. for the Vestry by Mr. Geo. Jennings, of Lambeth Palace-road, under the supervision of the Paving and Sewers Committee. The convenience is 60 ft. by 15 ft., and its floor is 10 ft. below the surface of the carriageway, the men's department is situate at the northern end, the refuge protecting the convenience, and it contains twelve urinals, six water-closets, and three lavatories. The conveniences at the northern end of the refuge, includes three water-closets and one lavatory. The staircases are 4 ft. wide, and the steps are faced with Mason's safety treads. The internal fittings of the urinals are of Jennings' Radial basin stalls, and the water-closets are of syphonic design, large apparatus. The Closets of the Century are the men's department, and "Midland" pattern the women's department. Both divisions of the convenience are ventilated by means of a Blackman's fan, working by water-power, the fan, after having finished its work in the fan, being used for flushing the urinals, &c. The floors are paved with black and white vitreous tiles. The roof of the convenience is constructed of rolled girders, fixed upon granite stone frames. There are three lamp-columns, which support five Sugg's lamps. The lamp-columns and the iron guard-rails were cast by Messrs. Pontifex & Co. The plumbing work has been carried out by Mr. Arthur Walter, silver and bronze medalist of the Orskilp Company of Plumbers. A charge will be made for the use of water-closets and lavatories.

T. Ridyard Roscoe is the Surveyor and Engineer to the Vestry.

UNION CHURCH, CLYDEBANK, N.B.—The new church recently completed at Clydebank opened on the 10th inst. The new church is of Gothic style, built in red Lochargers sandstone, with light green slate roof. The front faces Dumbarton-road, and the central aisle here rises to a height of over 60 ft., flanked on each side by octagonal stone-turrets, with steep tiled roofs, each over 70 ft. high. The main doorway is moulded and carved, and the gablet is enriched with moulded and cusped panelling. The central portion of the gable has a tracery window of large scale, divided by mullions and pinnacles, and the spandrels between the head of window and the side shafts are filled with a carved enrichment in vine and oak leaves. A band of cusped panelling extends across the gable above this window, and the centre is carried up by a canopy, the arch over which is foliated as forms the terminal feature. Side entrances are placed at the base of each of the stair turrets, series of cusped-headed windows light the staircases, and over these a band of rich carving is carried round, broken at the corners by projecting grotesque gargoyles. The upper stages of the open stonework tracery, forming bell-shaped piers, are roofed with steep conical roofs and are decorated with a series of small, somewhat similar treatment to the front, and are divided into four bays each, the lower stage with light cusped-headed windows, and the upper a series of four-light tracery windows, all of a design, placed between broad, plain piers of masonry. The organ-chamber is continued on the main building, in the chancel form, with a four-light window high up in the gable. The buildings form a lower group to the west of the main front. Internally the church is divided into nave and side aisles by massive fluted stone arches of very wide span, resting on piers, on each side. The pulpit gable is reached by a triple arch, carried on clustered columns, carved caps, the pulpit being placed in front of the central arch, with choir behind, the two side aisles are arranged for organ-chambers. The ceiling is lofty, and the roof of massive construction, whole main timbers exposed, and the ceiling of wood panelling, all stained to a dark oak tint. The side and end galleries, carried on beams and the columns. The floor from the chancel to the west end, including a hall seating 350, two large class-rooms, session-house, vestry, ladies' room, kitchen, &c. The finished cost is expected to

be about 7,000*l*. The architect, from whose designs the whole work and fittings have been executed, is Mr. John B. Wilson, Glasgow, whose designs were selected by the assessor from those invited in competition, and the work has been executed by the following contractors:—Mason, D. Winton, Duntocher; wright, Geo. Ferguson, Glasgow; slater, Lato & Son, Clydebank; plasterer, J. McDonald & Son, Kirkintilloch; plumber, Stalker & Dave; glazier, L. Adam & Co.; gas-piping, D. and G. Graham; gas-fittings, Milne & Son; upholstery, Gardner & Son; carving, Dawson and Sheriff; railings and gates, G. B. Smith & Co., Glasgow; painter, J. Taylor, Clydebank; and heating, Boyd & Sons, Paisley.

POST-OFFICE, PORTADOWN.—The contract for this work has been entrusted to the firm of Messrs. Colten Bros., Limited, of Portadown and Dublin, the cost of which will considerably exceed 4,000*l*. The site is in the centre of Bridge-street, and comprises a frontage of 60 ft. to that street, and a depth of 150 ft. along the new street which runs at right-angles to Bridge-street. The superstructure will be built of Ruabon red brick, with cut-stone dressings, the piers, frieze, and entablature, as well as the principal cornices, being executed in cut-stone. The ground floor contains the public office, measuring 15 ft. by 18 ft., in connexion with which is the postmaster's office. The architect for the building is Mr. Robert Cochrane.

TOWN HALL, MORLEY, YORKSHIRE.—The new Town Hall at Morley was opened on Wednesday last week. The building is in the Classic style, and the stone used in its construction has been obtained from the local quarries. The site on which it has been erected, from the designs of Messrs. Holton & Fox, of Dewsbury, is between Albion-street and Wellington-street. The structure is on the lines of a parallelogram, its dimensions being 140 ft. by 140 ft. The various floor levels of the basement are arranged to meet the level of the streets. To the left on entering are the offices of the Town Clerk and the Borough Accountant, and to the right those of the Borough Surveyor and the Inspector of Nuisances. Along the north corridor is the Borough Court, containing the usual accommodation, including a public gallery, and entered by swing doors, which are half-glazed in coloured glass. There are, adjoining the court, rooms for the magistrates, for their clerk and for solicitors and witnesses, and also offices for the magistrates' clerk. The Town Hall proper is 90 ft. in length, 46 ft. in width, and 36 ft. high, and the main entrance is from the central hall, direct from Queen-street, though there are two entrances also from Albion-street. At the northern end of the hall there is an orchestra extending right across the room. At the opposite end a large gallery, with a balcony on each side, has been erected, so that there is seating accommodation for 1,200 persons. The second floor is approached from the main staircase, and from the large waiting-hall, or gallery, access may be had to all the rooms on this floor. At the south end, near the corner of Queen-street, there is a banquetting or reception-room, with a small room attached. At the opposite corner is the Council Chamber, and here, as in the Borough Court, the interior has been panelled and dadoed to the height of 5 ft. There have also been provided a councillors' ante-room and retiring-room, a parlour for the Mayor, with a waiting-room and a large tea-room. The staircase next to the Town Hall communicates with an entrance in Albion-street, and also with the offices on the ground floor, as well as with the gallery and balcony in the large hall. Another staircase on the western side may be used in case of need. There are a large number of rooms for the different Corporation departments, the police-offices and cells. Underneath a portion of the large hall there is a smaller hall to accommodate about 600 persons. The large kitchen is provided with the necessary cooking apparatus, and there are lifts connecting it with the banquetting and other halls. The large rooms will be heated by means of hot-water pipes, and the offices by open fireplaces. Portions of the flooring are coloured blue, and the remainder pink, in encaustic tiles or mosaic, while all the staircases are fireproof, with cleaned stone steps, wood hand-rails, and iron balustrades. The doors are panelled and moulded, and the windows have moulded fixed sashes, with circular heads. The clock in the tower will be lighted by electricity. The total cost of the building is not expected to exceed 35,000*l*.

SCHOOLS, DARLINGTON.—New Day and Sunday-schools are in course of erection on site in Green-bank-road, Darlington. The new schools, which are being erected for the girls and infants, are in a central and open position in the parish, and are being built from designs and under the direction of Mr. G. G. Hoskins. The new building will accommodate 200 girls and 150 infants. The contractors for the various works are as follows:—Builders, Messrs. McKennie Bros.; joiner and carpenter, Mr. R. T. Snaith; slaters, Messrs. Wandless & Son; plumbers, &c., Messrs. W. Russell & Son; painters, Messrs. W. H. & W. Hoskins. The total cost of the new buildings including the land is estimated at 2,500*l*.

SCHOOLS, BELFAST.—The new schools in Eastland-street, Shankill-road, which have been built in connexion with St. Luke's Church, Belfast, have just been opened by the Countess of Shaftesbury. The new school building consists of two rooms, each

68 ft. long, by 30 ft. in width, and each having a class-room attached, 36 ft. by 21 ft., which can be shut off or otherwise from the main room by movable shutters. Attached to the school buildings is an extensive playground, with lavatories and other conveniences. The work has been carried out by Messrs. H. & J. Martin, of Belfast, from plans by Mr. Godfrey W. Ferguson, who received assistance from Mr. Herbert Ewart.

CONSTITUTIONAL CLUB, EGHAM.—The Baroness de Worms recently laid the foundation-stone of the new additional Constitutional Club premises at Egham. The work of the additions and alterations is being carried out by Mr. G. Gray, builder, of Egham, from plans by Mr. J. W. Oades, architect.

LECTURE HALL AND SCHOOLHOUSE, DUNKURRY, CO. ANTRIM.—The foundation-stone of school-buildings for Dunkurry Presbyterian Church was laid on the 19th inst. The plan comprises a lecture-hall 54 ft. by 38 ft., with porch and entrance from the main road. There are two projecting wings, which contain, respectively, a porch, with ladies' room, and on the other side a kitchen. The building is executed in Belfast best red brick, with moulded strings and panels of terra-cotta. The sills and keystones are of Dumfries red sandstone. The side walls are divided into spaces by buttresses. Windows, with arched heads and keystones, are placed between them. The wings have small gables, with circular panels and brick mouldings. All the windows will be filled with lead lights and cathedral glass. The roof is carried by strong principals, with iron tie-rods. Special ridge ventilators, with louvred openings, are provided. All the roofs will be covered with best Bangor Countess slates, with red ridge tiles. On the internal fittings pitch-pine is largely used. The heating is by fireplaces on each side wall. Mr. J. M. Roberts, Belfast, is the contractor, and the architects are Messrs. Young & Mackenzie.

SCHOOLS, BRISTOL.—The new girls' and infants' school which has been erected in the parish of St. Michael's, Bristol, was opened on the 19th inst. The building is estimated to cost about 2,700*l*. There are two stories, and the infants' school on the ground floor is capable of accommodating 150, and the girls' school above 120. The premises also comprise two class-rooms, teachers' room, cloak-rooms, out-buildings, and playgrounds. Mr. W. V. Gough has been the architect for the work.

CHURCH SCHOOLS, SHEFFIELD.—The memorial-stones of new church schools at St. Simon's, Sheffield, were recently laid by Lord Milton. The area of site of the new schools, which are to be known as the St. Simon's Blakeney Memorial Schools, including half of Porter-street and Alsop- and Union-lanes, is upwards of a quarter of an acre in extent. Accommodation is provided on the ground floor for 220 infants, and on the first floor for 180 boys and girls mixed. The playground for boys is entered from Porter-street, and that for girls and infants from Union-lane, both of which will be asphalted, and made private by boundary walls 6 ft. high. Externally, the building will be of Sheffield bricks, with red Carlisle stone dressings, and Welsh slating to the roofs. Each department will have a schoolroom 40 ft. by 22 ft., large class-room 22 ft. 6 in. by 22 ft., and small class-room 22 ft. by 17 ft. 6 in., all 14 ft. in height, with boarded floors, plastered ceilings, and having glazed pitch-pine divisions so arranged that the school and class-rooms may be utilised as one large room. The schools will be warmed with low-pressure hot water. Messrs. Joseph Martin & Sons, Mr. John Benson, and Messrs. Charles Chadwick & Sons are the contractors engaged on the work. Mr. Joseph Norton is the architect. The buildings alone will cost about 2,000*l*.

CHAPEL, NEWMARKET WORKHOUSE.—The new chapel at Newmarket Workhouse, which has just been completed and opened, has been erected from the design of Mr. J. Brown, of Burwell, the builders being Messrs. J. Simpson & Sons, of Newmarket. It is of black flint, with white brick and stone dressings, roofed with blue and brown slate, a bell-turret being placed at the western end of the roof. Internally the dimensions of the building are as follows:—Length, 60 ft.; width, 24 ft. The flooring is of wood blocks, except the choir and sanctuary, which are laid with enamelled tiles. The windows are fitted with cathedral glass, and a pitch-pine dado runs round the lower part of the walls. The roof is an open timber one, about 30 ft. pitch from floor-level.

PUBLIC LIBRARY, NEWCASTLE.—The Stephenson Library, in Elswick-road, Newcastle, recently inaugurated by the Home Secretary, Sir Matthew White Ridley, Bart., M.P. The building, which is 86 ft. by 43 ft., comprises two floors. On the ground floor there is a refreshment-room, committee-room, ladies' reading-room, general reading-room, and lavatory. There is a separate entrance to the centre of the building to these rooms. At the west end is the principal entrance into an entrance-hall, from which is the principal staircase to the upper floor. On the upper floor is the large hall to serve as the library and for meetings. It is 70 ft. by 36 ft., with platform and retiring-rooms. On this floor are also a smaller committee-room and ladies' room. There is a second staircase adjoining the platform. Externally the walls are faced with red Leicestershire bricks, with dressings of stone and pink terra-cotta, and the roof is covered

with red Ruabon tiles. The internal woodwork is stained canary-wood, except the roof of the large hall, which is of hammer-beam construction in pitch-pine, the ceiling being panelled with moulded ribs. The staircases are in pitch-pine. The whole of the windows have lead glazing in clear glass, except the staircase, which has a stained-glass window. The west entrance is carried up to form a small tower, and in the parapet is a stone shield, on which the arms and crest of Alderman Stephenson are carved. There are three gables on each of the north and south fronts, and in the centre gable on the north is a shield on which the city arms are carved. The general contractor has been Mr. Walter Scott; the roof-tiling is by Messrs. Beck & Sons, the plumbing by Messrs. Bland Bros., the painting and staining by Mr. John Gibson, the heating by Messrs. Emley & Sons, Limited, the iron casements for windows by Messrs. Ashwell & Nesbit, the lead glazing by Mr. G. J. Baguley, the door and other fittings by Mr. N. F. Ramsey, the carving by Mr. Howson, and the electric-lighting by Messrs. R. J. Chatterton & Co. The whole of the work has been carried out from the designs and under the superintendence of Mr. John W. Dyson, architect, of Newcastle.

CHURCH, SOUTHPORT.—On the 19th inst. the foundation-stone of the new Church of Emmanuel, Cambridge-road, Southport, was laid. The architects are Messrs. Preston & Vaughan, Manchester. The plan consists of a nave and aisles of five 19 ft. bays, having double transepts on each side. The aisles and transepts are lofty in comparison with the clearstory. The double transepts occupy the two easternmost bays of the nave, and the roofs finish below the level of the clearstory windows, thus leaving the clearstory, with its two long ranges of windows, unbroken from end to end. The choir is placed under a central tower carried by four stone piers, from which arches spring on each side. The tower will consist of a ringing chamber and belfry and will be 100 ft. in height to the top of the parapet. The outside is to have Runcom stone dressings and red pressed brick facings; the inside Runcom stone and terra-cotta dressings, and red and buff brick facings.

THE BUILDING TRADE, LARGS, AYRSHIRE.—There is a considerable amount of activity present in the Largs building trade. A beginning has been made with a number of alterations and additions to Currying Hall, which was recently acquired by Mr. William Clark, Newark, New Jersey. Besides additions to the mansion of Haylie, Mr. James Stevenson, the proprietor, is having a new carriage-drive made along the base of the hills behind the house. Another of the more important mansions of the parish, that of Mr. C. S. Parker, at Fairlie, is being remodelled and extended.

NEW COURT-HOUSE, &c., AT SCUNTHORPE, LINCOLNSHIRE.—Under the direction of the Standing Joint Committee of the Justices, and the Lindsey County Council, a new court-house, superintendent's residence, sergeant's house, cells, and stables have been recently erected at Scunthorpe. The entrance to the court-house is flanked by the justices' retiring room on the north side, and the witnesses' room on the south side. There are three oak doors leading to the vestibule, viz., one for the justices and the other two for the public. The justices' retiring room is 18 ft. by 15 ft. The witnesses' room is 15 ft. by 13 ft.; the witness will have access to the court without passing through the space allotted to the public. The solicitors and officials have a special entrance from the vestibule to the court apart from the public, and provision is also made for the Press. The dimensions of the court-house are as follows:—Length 55 ft., width 25 ft., and height to ceiling 22 ft. The north and south windows consist each of six leaded-lights with stone mullions. The ceiling is panelled between the five principals, of which the curved brackets rest on stone corbels. The bricks were supplied by Messrs. Spring & Halmshaw, from their Yaddletorpe brickyard, and the stone dressings from the Ancaster quarries. The ventilating apparatus has been supplied by Messrs. R. Boyle & Son, Limited. The wrought-iron gates and fencing have been supplied by Messrs. Hart, Son, Peard, & Co., of Birmingham. The heating apparatus to the court-house and cells has been supplied and fixed by Mr. William Mowbray, Lincoln. The gas service and fittings have been supplied and fixed by the contractors, Messrs. Wright & Sons, of Lincoln. The prisoners are brought from the cells to the court-house through an entrance-porch on the west side of it. There are three new cells provided, and a day-room, with electrical communication to the cells fitted by Messrs. Wallis Bros., of Lincoln. The drainage is complete in itself and ready for connection with the new system which the Councils of Scunthorpe and Easingham must ere long introduce. Large underground tanks have been constructed for storing the rain-water. The plans have been prepared by Mr. James Thropp, the Surveyor of the Lindsey County Council. Mr. R. D. Lockwood, of Scunthorpe, has been clerk of the works.

NEW WESLEYAN CHAPEL, WOLSTANTON.—On the 17th inst., the new chapel erected by the Wesleyan denomination at Wolstanton was formally opened. The chapel is in Late Gothic style. Red bricks are used in the facings of the elevations, and the tracery and dressings are in Houghton stone. The plan of the church is cruciform, having a nave 86 ft. long and 30 ft. wide, exclusive of the side aisles, terminating in an

octagonal apse, and with a transept 30 ft. wide and 25 ft. deep. The floor inclines towards the rostrum, and is furnished with open benches; pitch-pine has been used for the woodwork, and the windows are of stained glass leaded. The heating is by hot-water. The chapel is seated for 684 persons, and the orchestra will accommodate fifty; but on special occasions the accommodation can readily be increased to admit 1,000 persons. The principal window is to be filled with stained glass by Messrs. Camm & Co., Smethwick, Birmingham. The work, the cost of which will be about 4,000l., has been carried out under the direction of the architect, Mr. A. R. Wood (Wood & Hutchings) of Tunstall and Burslem. Mr. G. A. Foster, of Longport, has been the contractor.

SANITARY AND ENGINEERING NEWS.

LEEDS WATERWORKS.—A meeting of the Waterworks Committee of the Leeds Corporation was held on the 11th inst., when the Engineer (Mr. Hewson) reported that the works at Ectop were progressing satisfactorily, the quantity done being in advance of the contractor's time. The quantity of water in the reservoir was equal to seventy-nine days' supply, as compared with fifty-eight days' supply at the corresponding period of last year. The question of water supply to the highest levels at Beeston was under consideration, and the engineer stated that no real improvement could be made except by laying a main from the high-level pumping main at Whingate. The laying of this main would cost 1,000l., but it would form part of the mains which would have to be laid in connexion with the high-level service which it is intended to bring from the Washburn valley by new reservoirs to be built there. As these reservoirs will not be completed for about seven years, the engineer recommended that this work should be done at once, and so afford relief to the district. In consequence of the great necessity for improving the water supply at Beeston, the committee agreed to the suggestion, and the work will be proceeded with.

NEW RAILWAY IN WEARDALE.—The new Wear Valley Extension Railway, from Stanhope-in-Wear to Wearhead, a distance of about 9½ miles, has just been opened. After the cutting of the first sod by Sir Joseph Pease on October 21, 1893, the contracts were let for the work, which included the building of twenty bridges, the erection of stations at Stanhope, Eastgate, Westgate, St. John's Chapel, and Wearhead, and over two miles of sidings, in addition to the main line. In the construction of the line there have been used 225,000 cubic yards of earthwork, 8,000 cubic yards of masonry, 1,400 of brickwork, and 732 tons of ironwork. The customary Board of Trade inspection of the new line took place on the 18th inst., when Colonel Addison, R.E. (Board of Trade Inspector), was accompanied by the engineer of the new line, Mr. E. W. Lyall, C.E., of Darlington; the architect, Mr. W. Bell, of York; Mr. W. J. Cudworth, North-Eastern Railway engineer (Darlington), and others.

FOREIGN AND COLONIAL.

FRANCE.—The public exhibition of the competition designs for the rebuilding of the Cour des Comptes opens to-day, at the Palais de l'Industrie, and will be open till the 28th. The award will be given on the 30th. The group in bronze of an eagle and vulture fighting over the carcass of a bear, which was left to the City of Paris by the late M. Cain, the sculptor, is to be erected in the square Montholon, on an artificial rockery whence a fountain will issue. The new bridge over the Seine at Puteaux, between the mairie of that town and the Ile Rothschild, is to be opened next month. An observatory is to be established at the top of the mountain of Roche des Verts, near Annancy, which rises to a height of 1,000 metres. A new Fine Art School has been opened with much ceremony at Toulouse. The ceramic museum at Sévres has received an important gift from the Grand Duke Constantine, of Russia, in the shape of a large collection of ceramic objects, including some curious examples of German ware. An immense bell, cast at Annecy, has just been installed, under the direction of the architect (M. Raulin), in the new church of the Sacré Cœur at Montmartre. Considerable difficulty was experienced in getting the bell up to the top of the hill. A memorial statue to Pasteur is to be erected at Lille. A young French sculptor, M. Theunissen, has been commissioned by the Government of Hayti to execute a monument in honour of Pétiou, the founder of the Republic of Hayti. The monument will be erected at Port-au-Prince. A monument in honour of Gustave Nadaud, the song-writer, is to be inaugurated next spring, at Roubaix. M. Cordonnier is the sculptor. The monument will be composed of a lofty stele, supporting a bust of Nadaud, which a winged muse is in the act of crowning. At the foot of the stele is a semi-circular balustrade flanked by two figures representing Music and Song. The balustrade will also be decorated by two bas-reliefs representing subjects from the works of Nadaud. The Muni-

cipal service of Paris has suffered a loss in the death of M. Armand Renaud, Inspector-in-chief of Fine Arts and Public Works, who has died at the age of 59, after a long illness. M. Renaud, who for many years had been in frequent relations with the most eminent artists of the day, had been of great service to the Municipality, and was at once a learned connoisseur and an admirable administrator. He was also known as some excellent literary works, such as the "Nuits Persannes" and the "Drame du Peuple," and wrote, from time to time, fine literary poems, of an Oriental character, for Saint-Saëns' music. He has been replaced at the head of the office by M. Ralph Brown, who has been for fifteen years his friend and colleague. The death is also announced of the Comte de Clermont-Gallerande, who was well known for his pictures of sporting subjects.

GERMAN.—A large model of the new Berlin Cathedral is being prepared for the coming Salon. The model will be one-twenty-fifth full size, or to a scale of about half-an-inch to the foot. The sculptural work for the National Monument at Berlin is being now rapidly progressing. Professor Begas is being assisted by several sculptors of repute, who may, however, be considered his pupils. Messrs. Bernewitz and Goetz are his chief assistants. Everything in connexion with next year's National Industrial Exhibition is being done in a most business-like way, and we now hear that all the German Embassies and Consulates have received instructions from the Imperial Foreign Office to assist the executive committee in their efforts to make the occasion a success. The German colonies of the various capitals will be represented, and every facility given to Germans residing abroad to visit the exhibition. In connexion with the exhibition, a number of hotels are now being erected in Berlin. The Municipal authorities at Berlin have now definitely decided that asphalt is to be laid wherever possible in lieu of other kinds of pavements, and all roads to be taken in hand next year will be paved with the material. The Berlin Municipality continues to elaborate the new bridges over the River Spree, and has now commissioned Professor Siemens to prepare models for a large bronze group for the Gertraudenbrücke. A large assembly room has been opened in connexion with the circuit at Berlin. It holds 2,000 visitors, and is intended for banquets and dances. Berlin has had another bequest for the purpose of erecting a foundling hospital by the will of the deceased German contractor, Herr Schmidt. The sum of 45,000l. The historical Sans Souci Park at Potsdam is to have its entrances rearranged, so that the Friedenskirche and the mausoleum of the late Emperor Frederick will not be so conspicuous situated as at present. Breslau is to have a monument to the deceased Emperor William. Herr Behrens is the sculptor commissioned to carry it out.

MISCELLANEOUS.

REFUSE DESTRUCTOR, VESTRY OF ST. LUKE. In the Annual Reports of the Vestry of St. Luke the most important point mentioned is in regard to the inquiries which have been undertaken with a view to disposing of the parish refuse by means of a destructor. The Committee have under consideration, instructed their Surveyor to prepare a specification for a destructor to be erected. Messrs. Goddard, Massey, & Warner, at a cost something over 10,000l.

FLOODING OF BASEMENTS FROM A DEFECT IN THE MAIN DRAINAGE SYSTEM.—We take following from the "Sanitary Chronicles" of the Parish of St. Marylebone for August and September prepared by Dr. A. Wynne Blyth, Medical Officer of Health:—"The King's Scholars' Pond Sewer, one of the great main channels under the City of London County Council; it commences in Finchley-road, and discharges into the intercept sewer in the Embankment. It receives now enormous quantity of sewage from Hampstead, quantity that, as Hampstead is increasing, is increasing in volume. In any fairly heavy rainfall, this sewer in our parish appears runs full bore and blocks up all the side sewers running into it. The consequence is, that on several occasions there is a general rush of sewage through the ventilators connected with the system, and a serious ponding back of the drainage. Several years past the basements of houses in Mandeville-place and Wigmore-street have been caused by this sewer, and on September 7th a thunderstorm caused in this way serious inconvenience. The London County Council, through their Engineer, promised as far back as the autumn of 1893, to construct a relief sewer from Farringdon to Old Ford, which would remedy the evil complained of, but as yet, this has not been done."

BRITISH TRADE IN ROMANIA.—On Monday at the London Chamber of Commerce, Eastcheap, Mr. T. K. Graham gave a lecture on "Romania: its Financial and Trading Capabilities as a Market for English Manufactures." Mr. Graham said that while we were sparing no efforts to create markets in as yet undeveloped distant countries, we had in Rumania, within easy reach, an already well established market, with increasing requirements.

At the Leicester County Court on Tuesday last week, before His Honour Judge Wightman Wood, the case of Bruin v. Wellesley was tried. The plaintiff was Hardy Bruin, of Leicester, horticulturalist, and the grading of the defendant was Francis Wellesley, of the Honey Pots, Westfield, Woking, the claim being £38 18s., balance of account for greenhouse, glass, and carriage of empty crates and plants. The defendant, who paid into Court £3 18s. 6d., for costs, also lodged a counter-claim for £25 as damages for breach of contract by the plaintiff to erect a greenhouse at the defendant's residence at Woking, and also for erecting the same in a negligent manner. Mr. Simpson appeared on behalf of the plaintiff, and Mr. Garrett (instructed by Mr. Ernest Bevir, London) appeared for the defendant.

Evidence in support of the plaintiff's case was given by John Herbert Goodacre, head-gardener at the defendant's residence, who testified that he had examined the greenhouse, and found that the only place where the roof leaked was a small

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Prize.	Designs to be delivered.
*School	Essex County Sch. Govt.	.....	Oct. 31
*Plans for Sewage	Wantage U.D.C.	Two at 25 Guineas	Nov. 16

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Brick Channelling and Granite Kerbing, Offices and Sheds, Palmerston-road, Aberdeen	Southend-on-Sea Corp.	H. Harlock	Oct. 28
Extension of Bishop Hill-road	Northern Coop. Co. Ltd.	A. Mayer	Oct. 29
Sewer, St. Helen's-street	Haukester U.D.C.	W. H. Lamshire	do
Rebuilding Business Premises, Peter's Hill, Belfast	Haydon Nether U.D.C.	W. Farrington	do
Rebuilding Trafalgar Arch	P. & F. McIlride	R. G. Watt	do
Pilot Road Metal &	Yaro Rural Highway Committee	T. Clark	do
Houses, Pettit-street, Carlisle	Haukester R.D.C.	W. Wallwork	do
Additions, do to Station, Truro	G. W. R. Co.	G. A. Armstrong	do
*New Houses, St. Ryle	Admiralty	G. Griffiths & Jones	do
Hotel, Seaford House, Alnmouth, Northumberland	T. Binks	M. T. Wilson	Oct. 30
Two Cottages, Annisfield	N. E. R. Co.	W. Bell	do
Additions to School, Winsombank	Essex U.D.C.	G. A. Wilson	do
Street Works, Llanyma, Glam	M. H. Co.	G. Griffiths & Jones	do
Additions, do to St. Mary's National School, Monmouth	R. Griffiths	G. R. Halliday	Oct. 31
Rebuilding 88, North Parade, Aberystwyth	Barrett U.D.C.	Official	do
Extension of Pitting Shop, Holbeck	M. H. Co.	W. Hope	Nov. 1
Theatre and Hotel, Gatenhead	Weldon, Watts, & Co.	S. Hill	Nov. 2
School and Walls, Pool, Cornwall	Illogan School Board	Kay & Tait	do
Schools (Keston, Minsall, Bramley, Leeds)	Brierfield U.D.C.	Official	do
Street Works, near Burnley	Redwell Sch. Bd.	James & Morgan	Nov. 4
Additions to Upper School, Rhydyrry, Wales	Merthyr Tydfil U.D.C.	F. Dea-on	do
Waterworks	Llanelli Sch. Bd.	J. B. Morgan	do
School, Byma	South Town Charity	Jackson & Fox	do
Re-building Farmhouse, Brookholes, Mansfield, near Hallifax	Trust	Giles, Gough, & Trollope	do
Asylum Buildings, Colford, Wells, Somerset			

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Houses, Tullich, Ballater, N.B.	Acton District Council	Matthews & Mackenzie	Nov. 7
*Works at Cemetery	D. J. Roberts	Official	Nov. 8
*Well Sinking	Belvoir U.D.C.	Official	Nov. 9
Workhouse Wards	Admiralty	John & Moore	do
Infirmary Wards, Felling	Kewell U.D.C.	A. G. Evans	do
Extension of Sch. at Trenchard, Vyne, N.B.	Llanyma Sch. Bd.	A. G. Evans	do
Houses and Stabling, Mar Lodge, Braemar			
Wood-Paving, High-street	Chatham Corp.	C. Day	Nov. 7
*Broken Granite	Betham Green Vestry	F. W. Barrett	do
*Broken (Houses & Tyndmouth)	Admiralty	do	Nov. 8
Granite Gravel Spill	Barford Union	do	Nov. 9
Paving Works, Lincoln-street, &c.	Kingshorpe U.D.C.	J. Ingram	Nov. 11
*Broken Granite	F. C. Martin	do	do
Street Improvements, Bond-street, Southampton	W. R. G. Bennett	Official	Nov. 12
*Underground Conduits	C. m. of Sewers	Official	do
Sewer Work	Kingshorpe U.D.C.	do	do
Pipe Saver (240 ft.)	Croydon D.C.	R. M. Chart	Nov. 13
Pipe Saver (640 yds)	Oxendon (York) U.D.C.	Barber, Hupkinson & Co.	Nov. 14
School, Portmadoc	The Local Governing Body	W. H. Dackwood Cople	Nov. 10
*Trench House, Haydock, Liverpool	J. Allport	G. Hland	Nov. 10
*Trench House, Station Parade, Harrogate	Rev. A. C. Bulkeley	H. E. & A. Bown	do
Additions to F.M. Chapel, Rose-walk, Ipswich	W. Walton	T. W. Colman	do
Shelter and Rooms, Stamford Park, Ashton-under-Lyne		J. Eaton & Sons	do

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of the Works	Willodean Sch. Bd.	32 s. per week	Oct. 30
*Street Inspector	Leam Valley Vestry	24 weekly	Nov. 2
*Clerk of Works	Bluff Sch. Bd.	27 s. weekly	Nov. 4
*Chief Electrical Engineer	Eding U.D.C.		Nov. 6

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv., vi., vii., & xviii. Public Appointments, p. xvi.

crevice at one corner. He could not detect any draughts, and he considered the greenhouse in a very satisfactory condition.

The defendant, in his evidence, said that, owing to the ventilators not fitting, the plants were injured by the draught. The woodwork in the sides of the house cracked, and the roof was defective, allowing the rain to drip through in at least a dozen places. With the exception of the heating apparatus, he considered the greenhouse was useless.

Mr. Clump, architect, said he had examined the house, and he did not consider it properly built. The wood was not properly seasoned, and was not so good in quality as it should have been. It was putrid, and the glass was not of the proper size. The paint was also very unsatisfactory, and he did not consider the house was at present serviceable.

Mr. Garrett contended that the greenhouse was jerry-built, and almost useless.

His Honour held that there had been no breach of contract when reasonable allowance was made for the puffing that a dealer was allowed to indulge in when advertising his wares. Judgment for plaintiff, with costs on the claim, and the counter-claim was disallowed.

MEETINGS.

FRIDAY, OCTOBER 25.

Architectural Association.—Annual Conversazione, King's Hall, Holborn Restaurant. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Hill on "Diseases of Animals in Relation to Meat-supply: Characteristics of Vegetables, Fish, &c., unfit for Food." 8 p.m.

SATURDAY, OCTOBER 26.

Sanitary Institute (Lectures for Sanitary Officers).—Inspection of Richmond Main Sewerage, Mortlake.

London and Provincial Builders' Foremen's Association.—Quarterly Meeting, Memorial Hall, Farringdon-road, E.C. 7. 3 p.m.

Proposed Plymouth Branch of Devon and Exeter Architectural Society.—Special Meeting at Plymouth Athenaeum. 11.30 a.m.

London County Council, Technical Education Board.—(The Study of Architecture).—Mr. W. R. Lethaby will give two lectures at the Central Art Department of the Board, Bolt-court, Fleet-street, E.C. 4, on Saturday, October 26, and Saturday, November 2, at 3.30 p.m., on "Modern Building Design." The lectures will be addressed specially to architects and architects' pupils. Admission free.

TUESDAY, OCTOBER 29.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. C. Seaton on "Infectious Diseases and Methods of Disinfection." 8 p.m.

Royal Victoria Hall (Waterloo Bridge-road). Mr. H. B. Wheatley on "How London Grew." 8.30 p.m.

WEDNESDAY, OCTOBER 30.

Carpenters' Hall, London Wall.—Lectures on Building

and Sanitary Construction: I. Professor T. Roger Smith on "Timber, Site, and Foundations." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Inspection and Demonstration of Disinfecting Apparatus and Model Steam Laundry, St. John's Wharf, Fulham.

FRIDAY, NOVEMBER 1.

Institution of Junior Engineers (Westminster Palace Hotel).—Presidential Address by Mr. Archibald Denny, of Dumbarton.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. C. H. Cooper on "Principles of Calculating Areas, Cubic Space, &c.: Interpretation of Plans and Sections to Scale." 8 p.m.

SATURDAY, NOVEMBER 2.

London County Council, Technical Education Board.—(The Study of Architecture).—Mr. W. R. Lethaby will give two lectures at the Central Art Department of the Board, Bolt-court, Fleet-street. 3.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Inspection of Express Dairy Company's Farm, College Farm, Finchley. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

17,238.—WATER-CLOSETS: J. Spear.—This patent relates to a device for regulating the pressure, and preventing the inrush of water to closet-cisterns which usually produces an unpleasant noise after flushing. To effect the improvement a metal vessel divided into three compartments is interposed between the supply pipe and tank. The first division is fixed some two inches from the inlet-water pipe and bored with a small hole through which the water rushes to the other divisions, which are perforated more or less, according to the pressure, and thus regulate the flow to the cistern.

17,486.—PRESERVING WOOD: J. Matthews.—A composition for preserving wood, which consists of a mixture in various proportions of coal-tar, resin, pine-tar, camphor, gum, sulphur, tallow, carbolic acid, arsenic, phosphorus, borax, oil of vitriol, bichloride of mercury, cobalt, ground pole-root bark, and mineral dust made in the form of a paint or paste.

18,793.—WINDOWS: H. Kerr.—The sash-frames, according to this invention, are arranged to swivel inwards on hinges provided at their lower ends, and slide up or down on bars which run in grooves made in the fixed frame. A fastening device is provided for securing the sliding sash-frames to the bars, and other modifications are mentioned, including a ventilating chamber near the upper part of the window.

21,975.—SEWERS: T. Verce.—Dispensing with bricks for sewers and constructing such sewers in sections, each section being built up from segmental lengths of glazed stoneware, the meeting edges of which are so shaped as to fit into one another, and with the aid of cement, form tight-fitting joints.

21,543.—WATER-CLOSETS: E. Lefevre.—Relates to the employment of an automatic regulator-valve, which enables the basin of the closet to be supplied with water direct from

the water-pipe of the town, so that the pressure in this pipe may be utilised. Two clock-valves, or discs, on the same rod and bearing alternately in a contrary direction against a single seat, are arranged in a cylinder having an inlet and an outlet-pipe for the flushing-water. One of the clock-valves acts as a piston, and has a chamber above it, into which air is introduced by means of a cock. The apparatus is conveniently fixed between the supply-pipe and basin, and is actuated by the pressure on the closet-seat when in use.

21,943.—ROOFING TILES: G. Krebs.—Deals with tiles and methods of manufacturing same. The tiles are formed of cement, and have overlapping ledges, provided with projections and depressions, so that, when they are placed in position, a mortice-joint is formed. A strip of metal or felt is also employed for closing the joints between the flattened corners. A suitable press for moulding the tiles is claimed.

21,974.—FIREPLACES: E. Shaw.—The grate surface of stoves and fireplaces is formed of a convex or arched shape across and inclined from the back towards the front. Air-vents at the sides and back are of a tapering form, and fitted with converging plates for heating the air-currents. An improved flue of an oval shape in cross-section is also provided, and furnished with foot-plate and successive manhole-doors, so arranged as to keep the foot-plate cool.

10,862.—FLOORS, &c.: T. Jarrett.—This improved method of construction may be applied to floors, ceilings, and walls. It provides undercoat surfaces for the securing of tiles or plaster. Ordinary joints are used for supporting cement slabs formed with undercoat surfaces, and with their ends moulded to the outline of the flanges of the joints. The slabs are then levelled, and secured ready to receive tiles and the like.

13,452.—BRICKS: J. Wagstaff.—The bricks, or building blocks, are provided, some with dovetail projections, and others with corresponding recesses for receiving same. There are also projecting studs, and holes for receiving such, on the upper and lower side respectively of each brick.

NEW APPLICATIONS FOR LETTERS PATENT.

OCTOBER 7.—18,728, W. Johnson, Thumb-latch Door Handle.—18,732, A. Malcolm, Kitchen Boiler Safety Test Cock.—18,751, L. Rundle, Flooring of Stables.

OCTOBER 10.—18,859, L. Lea, Melting or Heating of Glue, &c.—18,858, J. Duncan, Combined Try and Reveal Squares.—18,844, F. Golby, Fireproof Rafters and Lathing for Buildings.—18,847, H. Cheffins, Grinding and Mixing Machines for the Manufacture of Portland Cement.—18,851, G. Clatworthy, Lead and Composition Pipes.

OCTOBER 9.—18,893, A. Mountain, Joints for Socketed Earthenware and other Sanitary Pipes, &c.—18,936, A. Boulton, A. Morrison, Weather Bars or Draught Excluders for Doors, or Holders for Lines.—18,950, P. Rohne, Clamps for Lines.

OCTOBER 10.—18,957, F. Brook, Pipes for Sewage, &c.—18,964, W. Macfarlane, Self-acting Barbed Saw Guide.—18,979, H. Roberts, Flushing Cisterns.—19,054, A. Hague, Sliding Door Hangers.

OCTOBER 11.—19,101, A. Cooling, Artificial Stone.—19,105, A. Morrison, Weather Bars or Draught Excluders for Doors.—19,114, W. John, Peg Mills.—19,126, C. Guckock, Bricks.

OCTOBER 12.—19,159, D. McCulloch, Supplying Baths, &c.—19,167, W. Edgar, Windows.—19,177, F. Willis, Fire Grates.—19,175, B. Fox, Window Fasteners, &c.—19,198, J. Long, Seats of Water-closets.

LONDON—For the erection of a junior medical department, to provide accommodation for 400 children at Gresham-road, Deptford, and for other work, for the School Board for London. Mr. T. J. Bailey, Architect.—
Walter Holt & Sons £73,750
B. E. Nightingale 12,774
W. Greig & Son 13,387
A. Keed & Son 14,168
Jas. W. Jones 14,187
Jas. Langley & Co. 19,385
W. Downs 10,948
Hart Bros 10,713
Atherton & Dolman 20,333
G. E. Wallis & Sons,
Maidstone..... 12,375

* Recommended for acceptance by the Works Committee.

LONDON.—For utilising the five court in the boys' playground of the Crampton-street School, Newington, for the construction of a Manual Centre, for the School Board for London. Mr. T. J. Bailey, Architect —

Johnson & Co.....	£734	0	W. Downs	£549	0
Thripps	585	10	G. Newton	511	0
Price Bros.	585	5	Rice & Son, Stockwell- road*	499	0
Maxwell Bros. Ltd.....	576	0			
I. Garrett & Son	529	0			

* Recommended for acceptance by the Works Committee.

LONDON.—For alterations and additions to the "Prince Alfred Tavern," London Fields:—

C. Deamey & Son	£511	Spencer & Co.	£48
Barker & Stuart	496	G. Colls	458

LONDON.—Accepted for new drainage and sanitary arrangements at St. Andrew's Home for Boys, at 26, Great Peter-street, S.W.—
F. C. Hoskins, Westminster £245

LONDON—For the erection of three temporary iron buildings in Mill-lane, New Park-road, Brixton Hill, for the School Board of London. Mr. T. J. Bailey, Architect:—

T. Cruwys, & Co., Ltd.	£2,300 0 0	Isaac Dixon & Co.	£1,763 76 0
E. C. & J. Keay,		Humphreys, Ltd.	1,675 5 0
Ltd.	2,637 0 0	W. H. Barrow, South	
Clegg, Son & Co., Ltd.	1,885 0 0	Bernerside, & Co.	1,548 14 0

It is recommended for acceptance by the Works Committee.

LONDON.—For sundry works to Vaccination Station and Work house, for the Guardians of St. George-in-the-East. Messrs Wilson, Son, & Aikwinkle, architects.—

G. Burton & Co.	£236 13	A. Heard & Co.	£219
Coates	256 8	Young	210
Vigor	235 0	Wall	209 0
Wilson	229 0	Thorne	197

LONDON.—Accepted for rebuilding factory, Blenheim-road, Hammersley-road, for the Executors of Mr. E. W. Clarke. Mr. E. T. Clarke, surveyor —
A. Heard & Co. £1,450
[No competition.]

LONDON.—For the provision of a manual training centre in connexion with the Nunhead-passages School, for the School Board for London Mr T. J. Bailey, Architect —

Jas. Smith & Sons	£1,503	J. Marsland	£1,631
W. G. & Sons	1,500	W. G. & Sons	1,631

Contracting Works, Ltd.	1,708	W. Akers & Co.	1,576
W. Downs	1,770	T. White & Son, Bow*	1,472
F. & H. F. Higgs	1,640		

* Recommended for acceptance by the Works Committee.

LONDON.—For the erection of an additional iron building on the site in Brook Green, Chelsea, for the School Board for London.

Mr. T. J. Bailey, Architect:—

E. C. & I. Keay, Ltd.	£715 0	Croggan & Co., Ltd.	£575 0
T. J. Hawkins	7 15 0	Humphreys Ltd.	538 0
T. Cruwys	655 0	W. Harbrow, South	
Isaac Dixon & Co.	641 2	Bermondsey	486 0
Hill & Smith	635 0		

* Recommended for acceptance by the Works Committee.

LONDON.—For altering and refitting the offices of all departments of the Oxford Gardens School, Notting Hill, and for providing a new system of drainage, for the School Board for London. Mr. T. J. Bailey, Architect:—
 R. A. Verbury & Sons £1,350
 G. Foxley 1,350
 Cowley & Drake 1,395
 H. Knight & Son £1,120
 G. Toog, Clapham 1,080
 Vernal, Daines, & Co. 1,045

LONDON.—For providing a new system or drainage for the Addington-street School, York-road, Lambeth, for making the necessary connexions with the existing troughs, and also for constructing two new water-closets for the teachers of all departments, the School Board for London, have invited tenders from the following persons:

G. Fuxley	910	I. Huxley & Co.	714
Star & Son	898	L. Whitehead & Co.	714
Lathey Bros.	898	I. Garrett & Son	799
L. Marsland	895	E. Taigels, Clapham*	691

* Accepted.

LONDON.—For paving works in Bailey's-lane, South Tottenham, for the School Board for London.—

Treasure & Son	£357	J. E. Rimmfield	£280
Thomas Rowley	335	G. Bell, Tottenham Wharf *	225
W. Gifford	212		

* Accepted.

LONDON.—For the erection of a school on the site in Upper Hornsey-road, Holloway, to provide accommodation for 1396 children for the School Board for London. Mr T. J. Bailey

Architect —			
R. A. Verbury & Sons ..	£29,181	T. Bryce	£25,577
C. Muskin	28,696	Hofter & Dicksee	25,552
W. Goodman	27,878	E. Lawrance & Sons ...	25,517
J. Shillitoe & Son	27,207	Kilbey & Gayford	25,240
A. Reed & Son	27,144	Wm Shurmur	24,984

W. M. Dabbs	26,728	Treasure & Son	24,757
L. H. & R. Roberts	26,295	J. Grover & Son	24,694
C. Cox	25,995	Atherton & Dolman	
W. Pattinson & Sons	25,682	Poplar*	23,628

* Recommended for acceptance by the Works Committee.

MIDDLETON (Lancs).—For the execution of sewage purification works, Land's End, Rhodes, for the Corporation. Mr. H. Hinnell, C.E., 15, Mawdsley-street, Bolton:—
E. Henthorne, Broad-street, Pendleton (at per schedule of prices).

MIDDLETON (Lancs) —For the construction of sewer, &c., (Contract No. 1), for the Corporation. Mr. Leonard Hinnell, C.E., 15, Mawdsley-street, Bolton:—
J. Ainscouth, Townfield, Oldham (at per schedule of prices).

NEW BROMPTON (Kent).—For erecting three villa-residences at New Brompton, for Mrs. E. W. Owen of Brighton. Mr. Ernest J. Hammond, architect, New Brompton:—

For Two Villas in Wind or road

Horscroft & Mills	£720 0	Weymouth & Smith	£594 0
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G. E. D. Woollard	620 10	H. E. Philips, New	
H. Harris	620 0	Brompton* ..	560 0
F. Hammond	506 0	E. W. Puley† ..	585 0

For Villa in Balnoral-road.

G. E. D. Woollard	£976 10	H. Harris	£710 0
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Horscroft & Mills	750	0	H. E. Philips, New		
Weymouth & Smith	776	0	Brompton†	585	0
C. E. Sklaner	778	0	E. W. Filley†	450	0
* Accepted.			† Withdrawn.		

NORTHAMPTON.—For the supply and delivery of twenty miles of drain-pipes, for the Corporation. Mr. W. D. Gibbons, Borough Engineer, Northampton:—

J. Wills & Co. agents for Moira

Pipe Co., Northampton	4 in.	£2 14	6 per 1,000
" " "	6 in.	4 6 6	" "



PURLEY (Surrey).—For the erection of a pair of villas, residences at Purley. Mr. John Jas. Downes, architect, 11, The Parade, Lewisham High-road, S.E. 1. Lorden & Son, 244 S. 209.
Seymour & Chessman, 244 S. 209.

SOUTHAMPTON (Hants).—For roadmaking, fencing, and drainage works, Hollybrook Estate, Winchester-road, Shirley, for the County of Hants Land and Building Society, Ltd. Mr. W. Burrough Hill, surveyor, 62, Above Bar, Southampton.—
Roadmaking and Drainage.

Honeychurch & Co., £510 0 0 A. Wheeler, £398 0 0
Richards, 445 10 0 J. Butt, 340 14 8
Pater, 400 0 0 Osmán, 324 0 0
W. H. Saunders & Co., 324 10 0 Crook, & Batten,
Playfair & Toole, 386 0 0 Southampton*, 295 0 0

Estimate.
W. J. Fox & Co., £510 14 1 Honeychurch & Co.,
J. B. Smith & Sons, 59 6 Southampton*, £80 0
* Accepted.

SOUTHAMPTON.—For rebuilding, premises, No. 180, High-street, Southampton, for Mr. W. T. Morgan. Mr. William Burrough Hill, architect, Southampton.—
Henry Lawrie, £2,650 10 0 H. Stevens & Co., £2,487
Playfair & Toole, 2,683 10 0 Jenkins & Sons, Bourne-
F. Walter, 2,547 month (accepted), 2,475
F. Osmán, 2,495

WAKEFIELD.—For main drainage works, for the Wakefield Rural District Council. Mr. Frank Masse, C.E., Tetley House, Wakefield.—

	Outward Contract No. 10	Outward Contract No. 11	Outward Contract No. 12	Outward Contract No. 13	Outward Contract No. 14
Matthew Arncliffe	£ 4 4 d.	£ 4 4 d.	£ 4 4 d.	£ 4 4 d.	£ 4 4 d.
I. Bunton	225 17 6	225 17 6	225 17 6	225 17 6	225 17 6
H. & W. Barrackburgh Big	152 10 0	152 10 0	152 10 0	152 10 0	152 10 0
house	214 17 7	214 17 7	214 17 7	214 17 7	214 17 7
Squire Booth, Earlsheaton	255 1 5	255 1 5	255 1 5	255 1 5	255 1 5
William Deacon	24 5 11 6	24 5 11 6	24 5 11 6	24 5 11 6	24 5 11 6
Garroth Bros.	217 2 0	217 2 0	217 2 0	217 2 0	217 2 0
H. B. & A. P. James	224 17 7	224 17 7	224 17 7	224 17 7	224 17 7
Simon Johnson	217 2 0	217 2 0	217 2 0	217 2 0	217 2 0
E. Kellett	224 17 7	224 17 7	224 17 7	224 17 7	224 17 7
J. E. Nadin	224 17 7	224 17 7	224 17 7	224 17 7	224 17 7
J. Pullan, Beeston, nr. Leeds	224 17 7	224 17 7	224 17 7	224 17 7	224 17 7
J. Schield	224 17 7	224 17 7	224 17 7	224 17 7	224 17 7
F. & C. Wilson	224 17 7	224 17 7	224 17 7	224 17 7	224 17 7
J. H. Wood	224 17 7	224 17 7	224 17 7	224 17 7	224 17 7

* Accepted.

WEYBRIDGE.—For the supply of 1,000 tons Farnham Hunry Hill flint, &c., for the Urban District Council. Mr. J. S. Crawshaw, Surveyor, Council Offices, Weybridge.—

	Per ton.	Per ton.
Farnham Flint, Gravel, and Sand Co., 6 1	W. Norris, Farnham*, 5 6 1	W. Norris, Farnham*, 5 6 1
W. Harrington, 6 1	F. H. Collins, 5 3 1	F. H. Collins, 5 3 1

200 tons of Farnham Gravel Screenings, Per ton.
F. H. Collins, 4 0
Farnham Flint, Gravel, and Sand Co., Farnham*, 4 0
* Accepted.

October 17th, 1895.

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52, Buckingham Palace-road, S.W.

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YOUNG & MARTEN,
Stratford, E.

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G. H.—R. H. W.—H. R. H. (amount should have been stated).
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The Builder.

VOL. LXIX. NO. 972.

NOVEMBER 2 1895

ILLUSTRATIONS

General View of the Design for the new Christ's Hospital School. — Messrs. Aston Webb & Ingress Bell, Architects	Extra Large Page Ink-Photo.
St. Andrew's Church, Willesden. — Messrs. James Brooks & Son, Architects	Double-Page Photo-Litho.
Halifax Bank Competition: Second Premiated Design. — By Mr. J. B. Mitchell-Withers, A.R.I.B.A.	Double-Page Ink-Photo.
"Leenside," Nottingham. — Messrs. A. W. Brewin & B. E. Baily, Architects	Single-Page Photo-Litho.
House at Woodside Park, N. — Mr. W. T. Walker, Architect	Single-Page Photo-Litho.

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The Blackwall Tunnel.

THE subaqueous portion of this important work has just been completed, and on Wednesday a number of engineers and others interested in the work were invited by Messrs. Pearson & Son, the contractors, to visit the works. It will be remembered that the work of constructing this tunnel was commenced early in 1891, and it was not, however, until September of that year that the really difficult part of the work, namely, that of making the portion immediately under the Thames, was begun; and now, after but twelve months' labour, it has been finished. Never before has a work of such magnitude and difficulty been accomplished so rapidly and with such freedom from accidents, for, during the whole period of construction, not one life has been lost.

It is now seventy years since Brunel commenced his tunnel under the river at Rapping, and since that time, as might be expected, many improvements have been made in the methods and appliances for constructing such undertakings. It is curious to note, however, that the means he then adopted to successfully accomplish the work which he will ever be remembered, have at least suggested the methods that are employed at the present day, and it has been suggested that it would be a graceful act on the part of the London County Council, and detracting in no degree from the credit to their Engineer, if medallion portraits of Brunel and Lord Cochrane—who was the first to suggest the employment of the pneumatic process for sinking cylinders—were placed at each entrance of the new tunnel. It is true the original Thames Tunnel is composed of brickwork, but there is evidence to show that Brunel would have preferred to have used a cast-iron lining instead, similar to that employed at Blackwall, if the cost of which at that date was about four times what it would be now—had permitted him to do so. In carrying out his great work, however, Brunel designed a "shield" capable of being pushed forward by hydraulic presses, or other means, and it is by the use of such an apparatus, modified and improved by Mr. J. H. Greathead, that engineers have been enabled to construct those subaqueous

tunnels that have been made during recent years, both in this country and in America.

The necessity of additional communication across the Thames below London Bridge has long been recognised, and the subject was under the consideration of the authorities of the City and the Metropolitan Board of Works many years ago. The Thames Tunnel at Wapping, and the small subway, suitable for foot passengers only, near the Tower of London, afforded for many years the only means of crossing this part of the river. An attempt was made in 1877 by the Thames Steam Ferry Company to deal with the traffic at a point about a mile and a-half east of London Bridge; but notwithstanding a considerable outlay, their efforts were at no time very successful, and their operations ceased altogether a few years later. This was followed by the Free Ferry at Woolwich, and later by the construction of the Tower Bridge; but there is a long stretch of river between these, and it was evident that additional accommodation was urgently needed. As long ago as 1886 the Metropolitan Board of Works instructed their Engineer, Sir J. Bazalgette, to prepare plans for a tunnel at Blackwall, and the sanction of Parliament was soon afterwards obtained to carry out the proposed work. Powers were then obtained to construct three tunnels, all close together, two of which were intended for vehicular traffic, and the third for foot passengers; and the Board considered it to be desirable to make the one for pedestrians first, it being smaller in diameter than either of the others. Tenders were accordingly asked for, and that by Messrs. S. Pearson & Son, who undertook to construct a tunnel 15 ft. in diameter for 318,840*l.*, was accepted. There is no doubt that this work would have been carried out, but just at that time the Metropolitan Board of Works were succeeded by the London County Council, and this latter body did not consider it expedient to proceed with the scheme as then proposed. The whole question was, therefore, thoroughly reconsidered, various engineers of eminence were consulted, and finally Mr. A. R. Binnie, the Engineer-in-chief to the Council, reported that, in his opinion and that of his colleagues, it would be best to have but one tunnel, making it 27 ft. in external diameter, with a roadway 16 ft. wide, and two 3 ft. 1½ in. footways.

New designs were then made, and tenders asked for, the result being that Messrs. S. Pearson & Son were again successful, the

amount of their tender being 871,000*l.* It must be remembered, of course, that this price is merely for the constructional work, and does not represent the total cost of the tunnel. The claims for land, and the various trade interests that it was necessary to acquire, amounted to an additional 432,000*l.*, although these have been settled, we believe, for about two-thirds this sum.

The construction of the tunnel is as follows:—Near each bank of the river a vertical shaft 58 ft. in external diameter has been sunk, and between the bottom of these the subaqueous portion of the tunnel, 1,221 ft. in length, has been made by driving from one end only. The approach to the tunnel on the Middlesex side is 2,470 ft. in length, and that on the Kent side 2,480 ft. in length, the gradients being 1 in 344 and 1 in 362 respectively. Between the entrance of each approach and the shafts above referred to, there is another shaft of the same diameter as those at each end of the subaqueous portion. These shafts are numbered for reference 1, 2, 3, and 4, counting from the Middlesex side, and besides aiding the ventilation they will all, except No. 3, contain stairways, and thus provide a means of access to, or egress from, the tunnel.

The portion immediately under the river, as well as the greater part of the approaches, is circular in diameter, and is lined throughout with cast-iron plates from 1½ in. to 2 in. in thickness; each plate is 2 ft. 6 in. wide, and fourteen are required to form a complete ring, they being bolted together by 1½ in. bolts. This cast-iron lining was made and supplied by the British Hydraulic Foundry Company; it is required for a length of a little over 3,000 ft., and the total weight is 20,000 tons. Work was commenced by sinking No. 4 Shaft or caisson, this one being chosen because it was foreseen it would be easier to drive the tunnel from this side of the river on account of the ground being more favourable, and it was thought that the experience gained in doing the simpler portion would be of great value when the work became more difficult.

All the four caissons are similar; they are composed of two skins, the batter of the outer one being 1 in 100 to facilitate sinking; and provision has been made for adding an air-tight floor, should it be found desirable to ultimately sink any of them by the pneumatic process. No difficulties were, however, experienced in sinking No. 4 Shaft, and it was not necessary to resort to compressed air. Loamy clay, peat, ballast, and London

clay were met with during the sinking, which operation occupied about nine months to accomplish. It may be interesting here to mention that the skin friction in the London clay and Thames ballast was about $\frac{3}{4}$ cwt. per square foot.

The shield that has been so successfully employed was made by Messrs. Easton & Anderson, of Erith. It is 19 ft. 6 in. long over all, 27 ft. 8 in. in external diameter, and weighs 250 tons. It is composed of an outer skin of four steel plates, each $\frac{3}{8}$ -in. thick, and an inner one extending for about half its length. The interior space is divided by two vertical air-tight diaphragms, the material, as it is excavated from the face of the tunnel, being passed through these by means of shoots, provided, of course, with air-tight doors. As the ground is excavated to form the tunnel, the "shield" is forced forward by means of twenty-eight hydraulic rams, each 8 in. in diameter, and as the ordinary working pressure to effect this is two tons per square inch, a total force of no less than 2,800 tons can be exerted, and even this has, at various times, been considerably exceeded. The rams can also be used to guide the "shield" in the direction of its line of travel.

Had the No. 4 Shaft been sunk to its full depth when the shield was delivered at the site, there is no doubt that the latter would then have been erected in position at the bottom of it, but this shaft was not then within a considerable distance of its ultimate depth, and consequently, in order to save time, a small dock was made close to, and connecting with, the top of the shaft, and in this the "shield" was entirely put together. By the time this had been done the sinking of the shaft had been completed, and the problem now was to get the "shield" from its dock into a position ready to commence the tunnel. An ingenious method was adopted to effect this. The ends of the "shield" were boxed in by timber, so that it would float, and water was afterwards admitted into the dock and the shaft, entirely filling both, since, as we have already said, these were in direct communication. The "shield" was then floated out of its original position to the centre of the vertical shaft, and then by gradually lowering the level of the water by pumping, it was caused to rest on the ground at the bottom of the shaft directly opposite the centre line of the tunnel.

In June, 1893, sufficient progress had been made to admit of the first of the cast-iron rings being put in position, and for some time after this, good progress was made, but when a length of 120 ft. had been constructed, the lower cutting edge of the "shield" got considerably damaged by coming into contact with some hard material, and although this was not at first considered very serious, it was afterwards found that the damaged portion could no longer be subjected to very great pressure. The "shield" had then advanced nearly 200 ft. from the shaft, and it was of course impossible to withdraw it, as the cast-iron lining of the tunnel for this length had been completed. It was also equally impossible to repair it in the position it then occupied, so that all idea of effectually dealing with the damaged portion had to be given up until it had travelled a further distance of 400 ft., and No. 3 Shaft had been reached. To admit of this being done a timber heading was driven in advance of the damaged portion of the "shield," and along the bottom of this a concrete bed was laid, and this arrangement made it possible to push the "shield" forward without further harm being experienced.

The driving of the tunnel was, however, suspended when it was within some 70 ft. of No. 3 Shaft, as it was thought desirable that this shaft should be entirely sunk before the "shield" was pushed further forward. This, of course, was the cause of some time being lost, and it was not until May, 1894, that the portion of the tunnel between Nos. 3 and 4 Shafts was completed.

As soon as the shield could be got into

No. 3 Shaft, the work of repairing its cutting edge was commenced. It was then found that the damage that had been done was greater than had been anticipated, and it took four months to get everything in working order again. Consequently, it was not until the month of September of last year that the subaqueous portion of the tunnel could be begun.

The construction of this portion was done rapidly at first, but when about two-thirds of the whole distance had been completed, the "shield" entered ballast that was in direct communication with the river, and the difficulties were then, of course, greatly increased. At this time there was only a distance of some 5 ft. from the river-bed to the top of the "shield," and an immense quantity of clay had to be deposited from barges along the line of the tunnel, a resource which was attended with most satisfactory results. Notwithstanding this and other causes of delay, the "shield" arrived at No. 2 Shaft a little more than a month ago, thus bringing to a successful termination a work of more than usual magnitude and difficulty.

It should be mentioned that compressed air was not employed for forming the tunnel until the "shield" was midway between Nos. 3 and 4 Shafts, and that the maximum pressure that has been found necessary has not exceeded 35 lbs. per square inch above the normal pressure of the atmosphere.

SOME DANISH CHURCHES.

DENMARK may be lacking in interest to the ordinary tourist, owing to the high state of agricultural cultivation which obtains throughout the country. Architectural joys do not meet us at every turn, as in Belgium or Holland, for instance, but the Renaissance, as we know it in Northern Europe, has made its influence felt here as elsewhere. It was in August last, during glorious holiday weather, both at sea and on shore, that the writer and a friend visited the country. Though absent from home but three weeks, the bracing climate, the perfect freedom of the country, and its cheerful and friendly inhabitants, have left a very favourable impression.

The route taken was direct from London to Copenhagen, "for the sake of the voyage," starting from Millwall Docks—to reach which, late on Saturday night, was the only part of the journey attended with any difficulty—on the s.s. *Oiga*, belonging to the Danish "United Steamship Company," which owns the largest commercial fleet in the world so far as numbers are concerned, the officers and crews being all Danes. The company carries on a large trade, chiefly with Baltic and Mediterranean ports. The Danes are, of course, splendid sailors; many of them find employment as seamen in our own merchant service; it is probably to our kinship with them that we owe our pre-eminence as a naval nation.

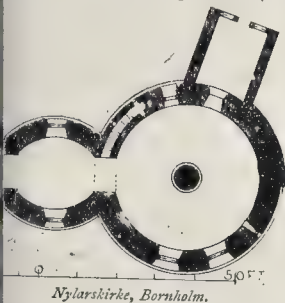
The coast-line of the west and north-west of Jutland is low, and dotted here and there with summer bathing-places, as is the case all along the Danish sea-border. Through the Skager Rak, round the Skagen Point, with its fine lighthouse, better known to English sailors as the Skaw, then making nearly due south through the Cattegat for the Sound, past the fine old Castle of Helsingör, only two and a quarter miles from the shores of Sweden, which are well wooded, with the town of Helsingborg spreading itself along the coast; the large number of fine sailing ships engaged in the Baltic timber trade, which all have to pass through these narrows, adding wonderfully to the interest at this point. Helsingör is the Elsinore of Shakespeare's Hamlet, and off here Campbell laid the scene of his fine poem, "The Battle of the Baltic." The castle, quadrangular in form, is imposing and picturesque, being built of stone (1574-85), some older work—the

castle proper—being incorporated with it. It has high dormers on the sea-front, with three tiers of lights in them, and above all stands a copper-covered lofty bulbous spire of several stages; the angle towers are octagonal. Four hours more at sea, hugging the wooded shore of Zealand, dotted with comfortable-looking summer residences, rounding the island battery "Tre Kroner," and we were at Copenhagen—or Kjöbenhavn, as the Danes spell it—some sixty hours' voyage from London. Conspicuous objects from the harbour are the twisted spire on the Bourse, formed of four dragons in lead, whose heads sprang over the angles of the turret from which it springs, the modern dome of the Marble Church, the lofty "corkscrew" spire of St. Saviour's Church with its external stairs, and the great Round Tower, which has a winding roadway up it. The town is chiefly paved with granite blocks, is well supplied with parks and gardens; advertisements are conspicuous by their absence. The chief street, the Øster Gade, contains the finest shops, which are all solidly built from the ground, not stilted up on "lead-pencils" and plate glass. The town is also rich in royal palaces for the most part of dignified appearance. The Amalienborg in reality consists of four small palaces across the angles of a public square, two of which form the residence of the king when in the capital. Outside the door are two sentries, in uniforms not unlike those of our Guards in 1814, who hug the magazine-rifles in the manner made familiar to us by Mr. Punch. Most of the palaces are occupied as museums and art galleries; notably the Princes' Palace. (By the way, "slot" is the—to our ears—undignified Danish equivalent for a palace.) The local S. K. M. is very rich in Scandinavian art treasures of all kinds, dating from the earliest times to the seventeenth century, and, inferior to our own collection, is, at any rate, infinitely better housed. Other exhibits in the Rosenborg Castle carry on the sequence to the beginning of this century. This castle is of red brick and green sandstone, built early in the seventeenth century, in a style reminding one of Elizabethan. Of this period and style also are two churches, a few houses, and the Bours also the celebrated Frederiksborg Slot, about twenty miles from the capital, of three islands in a lake surrounded by beech forests; it is known as the style Christian IV.

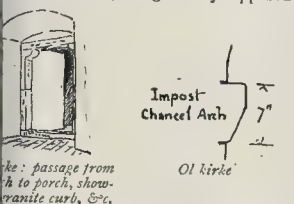
Thorwaldsen has a museum to himself, and there is another museum of sculpture collected and presented to the nation by the brewer of Carlsberg öl; we did not visit it, but we drank the "öl," and very good it was, particularly the "gammele Carlsberg," so should the firm repeat their gift to their fellow-citizens, we shall have the satisfaction of reflecting that we have contributed towards it. The town is very flat, and forms a happy riding-ground for innumerable bicyclists, the "machine" being largely patronised in Denmark; the sanitary arrangements, even the best hotels, are primitive, drains, as we understand them, not being in vogue.

From our head-quarters at the Hotel Kongen at Danmark we made several excursions, the most interesting being a voyage to Bornholm, an island situated in the Baltic about twelve hours by steamer from Copenhagen; it belongs to Denmark, is about twenty-four miles long by twelve miles broad, an exposed spot enough, out of sight of the mainland and wind-swept by the northern eastern gales. Landing at Rønne, we found it to be a town of three or four wide and winding streets paved with cobble-stones, flanked by low whitewashed houses of scrupulous neatness, many of them half-timbered, standing on a dwarf wall of large stones, the post not framed into a cill-piece but resting on the wall; the shaped-ends of the tie-beams project through the posts, and are pinned with wooden keys; about a foot or so above these are the dripping eaves of the red pantile roofs; some have low dormers, and the brick chimneys are very low; cas-

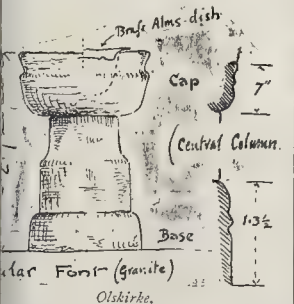
nts of wood with iron straps at angles all are hung to open. Gable-ends pro, and are boarded perpendicularly; there some variety in the treatment of the rs and doorways. These remarks may ly generally to all the houses we saw he island. A twelve-mile drive from ine to the rocky north-east coast, and we d ourselves at the pleasant summer rt, "Helligdomsgaarde," of many Danes Germans, where we were the only lish visitors. Along this coast are the rocky cliffs in the whole of Den- k. Bornholm contains some remarkable ches, which succeeded in arousing the rest of my sporting companion. I mea- d two of them, plans, &c., of which I am to place before the readers of the lder. Four of these circular churches exist. Olskirke and Osterlars I mea- d; I also give a plan of Nylarskirke from or Heale's "Ecclesiology of Gottland, r than that of Wisby; and the Churches ornholm," published in 1889, in which so given a section through Olskirke, and



od photograph of Nylars, showing one e characteristic belfries, a book I should een glad to have known before my visit. ld I have another opportunity of going ll take it with me, and hope not to the camera behind at Copenhagen! other plan is from "Murray's Hand- for Denmark."



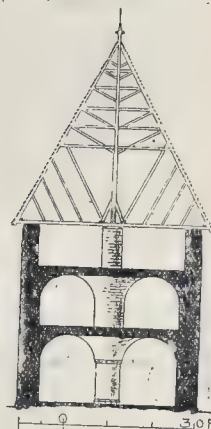
ve been for deposit of weapons before n to worship. A large west gallery, ining a small organ and seats, cuts ardly into the vaulting. This gallery, ats in the nave, and the reredos, which



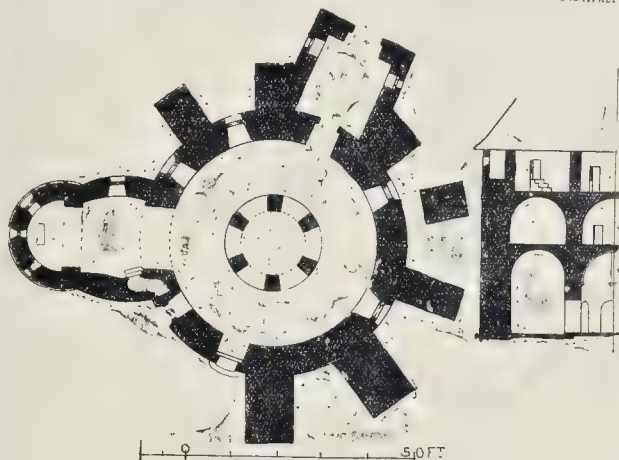
ins an oil painting, are of varnished pine, exceedingly mean. The whole effect ry unusual, if only from its extreme rity. The chancel arch, 7 ft. wide, is



Olskirke, Bornholm.

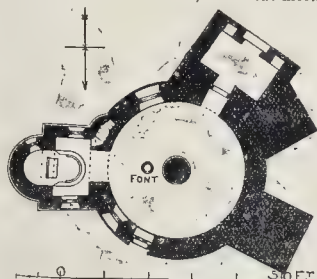


Section - Olskirke.



Osterlars, Bornholm.

9 ft. 6 in. high in the centre; the entrance to the stairs is nearly 9 ft. above the floor-level, and is reached by a ladder. The central column and circular vault is repeated above, but in this case without whitewash, the dark brown limestone, with wide mortar



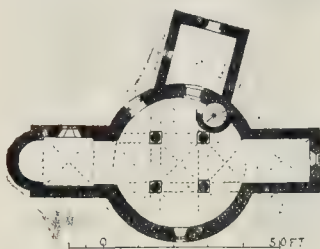
Olskirke, Bornholm.

joints, being exposed. The conical roof of rough timber and of moderate scantlings is open to the next floor, which we found encumbered with rubbish, twigs, and other ingredients of many generations of birds' nests. The roof rested on the outer wall, without any plate, and very possibly dates from 1794, which date is perforated on the weather-vane. Osterlars Church lies rather more inland, in

a still more lonely situation, having but one farmhouse within "shouting distance" of it, the occupier of which was a find, as he spoke English well, having been a sailor, and also a miner on the New Zealand gold-fields; he and his wife and family do most of the farmwork themselves, seemed to enjoy the process and to be quite satisfied with the result. His wife was weaving, at an old-fashioned hand-loom, wool grown on their own sheep, to be made up by themselves into clothes for their own use. This church is rather more ambitious in plan, and has curved walls to the chancel. The buttresses, which are enormous, are looked upon as additions; possibly the vaulting was thrusting out the walls. Iron ties show outside here, as well as in other cases, and here, as elsewhere, one is debarred from much possible archaeological "fun" by the thick coats of dazzling whitewash. A restored fresco of a very early type decorates the outer surface of the inner wall above the arches of the inner dome, and in the apse are to be seen the remains of what was probably a pre-Lutheran stone altar; the apse is used as a vestry. In the great square belfry near the church are two bells of very fine tone, the largest being 3 ft. 2 in. in diameter; each had an inscription around it, and very beautiful borders in high relief, and on one occurred a crucifix, with the B. V. M. and St. John, and on the other "S. Niclas" as a bishop, most delicately modelled; they bore dates 1684 and 1640. One hesitates to

account for the peculiar planning of these churches, for fear of proving too much, without sufficient familiarity with the subject, and given which, no doubt one could prove anything; that they are identified in some way with the first planting of Christianity in these parts in the twelfth century there can be little doubt, or that they served as fortified strongholds against surprise visits from marauding Vikings and others. English history tells us what very disagreeable tourists the Danes could prove, whether personally conducted by Messrs. Hengist and Horsa in the fifth century, or later, when they "came to stay" for some five hundred years.

Though so singularly devoid of detail or refinement, and so "early," I cannot but think these churches worthy of careful study, and hope they may be long preserved. An occasional reversion to any primitive type, however rude, need be no bar to one's appreciation of later developments of style; we see examples of it in nature, in both the botanical as well as in the animal world, when long subjected to high cultivation, and it may well be that the same process in the art world may help to secure for our own work those qualities of force and vigour which we might otherwise be apt to neglect; this would also tend towards real progress—if wisely undertaken—for we must recollect that progress is the art of going backwards. There are other churches in the island which are rectilinear in plan, and the ruins of a castle at the extreme north point of great interest, but these we did not visit. In addition to the one at Thorsager in Jutland, which, "Murray" says, is built of brick, the same authority mentions



Thorsager Church, Jutland (from "Murray").

one in Fyen, at Horne, near the shore of the Little Belt, as "originally circular," also at Gjorslev, on the coast of Zealand, an old mansion containing a hall with "a single central pillar," and not far off at Store Hedinge "a remarkable old church originally octagonal." We visited the Cathedral of Roskilde, about twenty miles from Copenhagen, where most of the Danish kings are buried. It is built of brick, and vaulted 82 ft. high inside. Many of the royal tombs are sarcophagi, covered with black velvet, and silver and copper plaques. There is some very rich ironwork, dated 1625, enclosing some of the chapels. The altar-piece is a magnificent Renaissance triptych, in twenty-one compartments, elaborately carved, painted, and gilded. It is supposed to be Dutch and sixteenth-century work.

Another long excursion was by steamer and rail to Frederikshavn, and on by a miniature railway to Skagen, the most northern point of Jutland; a wild district of sandhills and heather, a favourite spot for artists of the modern Danish school. The church is modern, but contains a fine old model ship, suspended in the nave, and a pair of Gothic brass candlesticks, dated 1590, exhibited with some pride by the minister, who informed us that the tower we had seen half-buried in the sand is all that remains of the old church dedicated to St. Lawrence, and founded in 1459 by two sailors, a Scotchman and a Dutchman.

H. ROSE.

* "A round church (1150) at Bjernede, . . . Besides this there are only two in Denmark, though four others are found in the Island of Bornholm."

NOTES.

THE way in which the London County Council deals with the water question is enough to make the public doubt if it will ever show real business capacity. Having rejected an amendment to the Report of the Water Committee that the Bills of last Session should be proceeded with, it last week passed an amendment in the following terms:—"That the Council, having decided not to proceed with the suspended Water Bills, and desiring that the Council should be the Water Authority for London, it be referred to the Parliamentary Committee to report without delay the lines on which they suggest the Government should be asked to legislate." That is to say, having declined, as was quite right, to go on with these Bills and to leave the matter in the hands of the Government, the Council gives directions to a Committee to prepare a scheme, or its outlines, which the Government is to carry out, based on the principle that the County Council is to be the water authority for London. The Government, which rightly should have the responsibility of settling this great question, must be left with a free hand to lay down the principles and the details of the change. It is obviously childish for the Council to suppose that the Government can accept the outlines of a Bill from them. When the Government measure is prepared it will be reasonable to criticise it, and for the Council to lay their views before the Minister in charge of the Bill by the ordinary means of a deputation. It is improbable that the Government will accept the primary principle that the Council is to be the water authority for London; even if it should do, it will be on its own responsibility, and not at the dictation of the Council, which has hitherto failed to effect any solution of this important matter.

THE Nicaragua Canal seems to be causing interest in great canal work, and if the statements given by Mr. Colquhoun, at the meeting at the London Chamber of Commerce on Monday, are to be relied on, there seems to be, at least, more chance for its execution than there ever was for the Panama Canal. As to the doubts which were expressed at the meeting whether the probable traffic had not been over-estimated, and too favourable a view taken as to the paying properties of the canal, our impression is that a canal in such a position would, to a great extent, make new traffic, and that the shortened route between the Atlantic and Pacific, and the avoidance of the necessity of going through the Straits or round the Horn, would actually give a new stimulus to shipping trade.

AS will be seen from our report of the proceedings of the London County Council at the meeting on Tuesday, the recommendation of the Works Committee authorising them to let for advertisement purposes the hoardings which will be erected at the Whitefriars fire-station, was agreed to by a large majority. It is to be regretted that the amendment moved by Sir John Hutton to refer the matter back was defeated, especially as the County Council, many of whose members profess to desire the beautification and not the disfigurement of London, might have been expected to set an example to others in this matter; but the decision which was come to seems to have been based upon a monetary consideration, or regard for the "ratepayers' pockets" and the allurements of a "large sum for letting the right of advertising on the hoarding." With the majority of the Councillors, the question of aesthetics received little consideration, though one of the labour members, who claimed to desire the beautification of London, was bold enough to remark that the ultimate result of letting the Council's hoardings for the purpose in question would be to make London a veritable "picture-gallery," and it was further urged by another

speaker that many public advertisements were very beautiful—the inference presumably being that therefore the ugly ones might, on that account, be endured. It is surprising that the Council seems prepared to accept a lower standard than that set by the City in this matter, or by Glasgow, where the Corporation has decided that all municipal trams shall not be disfigured by advertisements. But more practical considerations might have influenced the Council, for it cannot be doubted that advertisements on hoardings tend to depreciate surrounding property, and the hoardings are kept up much longer than they need be until the advertisement contract has expired. The recommendation of the Committee related only to the Whitefriars fire-station hoarding, but there can be no question that, unless the members of the County Council materially alter their views, the practice will be definitely extended, and the streets of London made to look more hideous than they are at present.

MAJOR CARDEW has issued his report to the Board of Trade regarding the fatal accident to an English cyclist in August last on the Giant's Causeway Electric Railway. He finds that death was due partly to electrical shock and partly to the injury received by falling across the rail. He recommends that the tramway company be compelled to raise their charged conductors which is at present only 18 in. from the ground, to a height of 8 ft. at least, as at present it is an annoyance and a source of danger to the ordinary traffic. He also considers that the tramway company should be called upon for an explanation of why they have not complied with the existing Board of Trade regulations, and that until they do, and have made the required alterations they should discontinue the use of electric power and use only steam.

THE Imperial Law Courts at Leipzig, which were opened by the Emperor on Saturday, have been erected from designs by Herr Ludwig Hoffmann, on whom the title of "Baurath" has now been conferred in connexion with the ceremony. Hoffmann obtained the commission for the important building in an open competition which was held in 1884. The able plan shown in the design gained him the 1st premium. Owing to the successful career of his youth and inexperience, and further to his having been associated with a Norwegian, M. Dybwad, in the preparation of his drawings, Herr Hoffmann met with much opposition prior to being entrusted with the work. He was at the time only thirty, and had not held a responsible position. He had only been known as a successful competitor for the Shinkel Prize and other academic premiums. The successful completion of the building has shown the authorities that they did well to accept him as architect, and we congratulate him on the able way in which he has carried out the work. The design has been a subject of study for ten years, with constant revisions and improvements. Models, even to the extent of full-coloured plaster renderings of the facade have been profusely used, and there are few details in the building which have not passed through the modellers' hands before they were carried out. The building is an excellent example of the result of careful study.

AN extraordinary number of ceremonies are at present taking place in Germany on the occasion of the opening of public buildings, the unveiling of monuments, the consecration of new churches, the Emperor's visit to Metz, Strasburg, and the battlefields of the Franco-German War, and the occasion for unveiling several memorials. Of these the most important one is the Emperor Frederick Monument

berth. At Berlin the unveiling of a monument to the Empress Augusta on the "periplatz" took place on the same day the consecration of the new memorial arch to the Emperor Frederick. At Pzig the New Imperial Supreme Law Courts were opened by the Emperor, and at Frankfurt a new Central Post-office, which is architecturally a district centre for South Germany. At Darmstadt the new Royal Technical College was opened, and at Bremen there was a ceremony in connexion with the completion of some new Courts of Justice. Of the churches inaugurated in the provinces the principal ones were at Cologne, Dortmund, and Düsseldorf. Numerous other ceremonies have yet to take place.

MR. ARTHUR J. EVANS, writing to the *Times* from Dublin, raises a plea which we heartily sympathise, for the nation of an Irish museum of national antiquities, in place of the mere things from South Kensington, which, according to his account, now form the bulk of the contents of the exhibits in the Museum of Art and Art Department. It appears that the Royal Irish Academy have already together a collection which would form a nucleus for a national museum, if it were properly arranged and exhibited, and which might be much further extended. We hope Evans's suggestion will not fall to the land.

HE have of the Abbey, or more correctly the Priory Church, of Llanthony, has been restored, under the superintendence of Mr. J. J. Spencer, of Aberystwyth, by the liberality of Lord Llangattock, Walter Savage Landor, and others. It stands on the reputed site of St. David's chapel, by the River Honddu,* in the Vale of Ewias, at foot of the Black Mountains. That romantic spot Bishop Urban consecrated a chapel or hermitage of Erisius, plain to Maud, Henry I.'s consort. In this gave way to a priory founded by Hugh de Lacy, Earl of Hereford, for forty monks regular of the Order of St. Augustine, dedicated to SS. Mary and John the Baptist. Owing to troublous times most of the monks sought refuge in the new Priory of Llanthony, which Milo, Hugh's nephew, bequeathed for them at Gloucester. The new foundation rapidly fell into decay; on the Severn prospered so well that its value was 748*l.* (*testis* Speed) at the dissolution; whilst Llanthony, in Monmouthshire, had but 9*l.* yearly. There are ruins of the ruins in the "Antiquities of Great Britain," by T. Hearne and W. Byrd, and, with a plan, in Cox's "Historical Tour in Monmouthshire" (1801)—in the latter work being after drawn by Sir R. C. Hoare, Bart. The church is a ruin on a plan, and in many respects like to Llandaff Cathedral. At the Dissolution, Llanthony was granted to one Richard de Lacy. In the last century it belonged to the Earls of Oxford; it then passed to General Wood, by purchase from Lord Oxford, and then to Walter Savage Landor, eminent author.

HE Dean of Canterbury, in his capacity as co-trustee for the preservation of Dover Castle, makes an appeal for a sum of at least 300*l.*, which is yet required for securing and protecting the site and the buildings, an amount of 1,070*l.* having been previously subscribed to that end. In a "Note," September 2, 1893, we described the ruinous and present condition of this national monument, which, as Dean Farrar says, is so full of interest, and beyond question ought to be placed in safety as one of our national possessions. Rutupia, the name given, jointly, to the two castles which were situated at either end of the estuary which separated Thanet from

the mainland: the other haven was Reculver, built by Severus, to whom the Portus Rutupinus, the Saxon Reptaceastre, also is attributed (see Hasted's "Kent," Vol. III.). To repel the Saxon depredations by land and sea, the Second Legion, known as the "Augusta" or "Britannica" Legion, was brought hither from Isca Silurum, or Caerleon, in 368 A.D., and formed the garrison until the Romans finally quitted our shores. Tacitus records the arrival here, with his fleet, of Agricola, who started hence upon his coasting expedition round Great Britain; and to Richborough he returned. To what we have already said we may now add that a burial-ground discovered on a broad hill of sand, about two miles distant, near Gilton, in Ash parish, is supposed to be that of the ancient settlement; and that outside the castrum north wall has been found, by the riverside, a platform or landing-stage, built of square tiles, and leading to the Wantsum.

A CORRESPONDENT writes:—"In the Birmingham Municipal Art Gallery there has been for some years a model of the Birmingham Town Hall, which is little known, and is worth inspection by architectural visitors to Birmingham. The model was made in ivory to $\frac{1}{16}$ in. scale, by Mr. Philip Barrington. Detailed drawings were prepared for every part of it, and every piece of ivory is a model of the corresponding block in the building. The capitals, columns, and cornices are minutely finished after the original detail. Each column is fastened with steel spindles through its entire length, and screwed securely to base and entablature. The windows and doors have been cast in moulds and filed out of gilding metal. The roof, in exact imitation of the original, is covered with fine sheet lead. It is computed that the model consists of not less than 25,300 distinct pieces."

WE have received some samples of a paint called the "Marpedo Washable Water Paint." The paints are supplied in the form of thick paste, which, thinned down with hot water to the consistency of ordinary paint, have good covering power, and dry quickly, though the thorough setting or hardening of the surface takes some time longer. We have tried them on wood, cement, stone, and brick surfaces with satisfactory results; and we should say that those who require a cheap, easily-applied paint in place of ordinary distemper will be well satisfied. The paints will not resist sulphur-laden atmosphere without considerable darkening of colour. Acids, also, decompose them rapidly. We should consider them to be especially suitable for the interior decoration of churches, schools, and other public buildings; the manufacturers claim, however, that they are equally suitable for exterior work, "being impenetrable by rain, and unaffected by atmospheric changes."

A CHARACTERISTIC debate took place in the Dover Town Council last week in reference to a proposal to adopt a new code of building by-laws, when Alderman Pepper (the Deputy Mayor) moved "that the new by-laws be not approved." From the report of his speech we gather that the by-laws had been drawn up in accordance with the Local Government Board model, and that Alderman Pepper and various members of the Council disapproved of them because they were a great deal too good. Alderman Pepper, indeed, gave as the reason for his motion that the Council was a municipal body, and "not subsidiary to the Local Government Board like Boards of Guardians," but it is pretty evident from the discussion which followed that there is a great tenderness in Dover for jerry-building and jerry-builders, Alderman Pepper remarking upon the "injurious" way in which certain persons had

talked about "jerry-building." Another member considered that the by-laws were quite unfitted for Dover, and "would only cause friction if adopted"; which means, we presume, that a number of persons would be determined to evade them. Councillor Thorpe spoke up strongly in favour of the by-laws, and on the disgraceful way in which building was carried on in Dover; but Alderman Pepper's motion was carried, and for the present the jerry-builders of Dover may carry on their work unmolested. The result does not seem creditable to the Council.

THE Annual Conversazione of the Architectural Association was held this year at the King's Hall, Holborn Restaurant, on Friday the 25th. There is not the space here that there is at the Queen's Hall, where the last year's assembly was held, and the room seemed a little crowded for a promenade entertainment, but the evening was very successful on the whole. During the early portion of the evening the guests were formally received by the President and Mrs. Caroe. The musical part of the entertainment consisted of some very good performances by the Rebec Orchestral Society, alternated with the Pierrot Banjo Team, who are artists in their way, though one or two of the songs given as encores, or one at least, savoured too much of sheer music-hall-ism, which, to our thinking, ought to be considered beneath the level of entertainment for a society like the Association. In the vestibule were a number of objects of interest. Mr. Walter Crane lent some of his sketches of ornament, in white or brown paper, which were used to illustrate his paper at the Association, and some of which have appeared in our pages. Messrs. White, Allom & Co. lent a very interesting Renaissance chimney-piece from Wren's house; Messrs. Morris & Co., Stalman, and Essex & Co. lent tapestries and wall-papers (some of the silk hangings by Messrs. Morris & Co. were superb), and Messrs. Vickers & Co. lent specimens of ironwork. Among the drawings exhibited were work executed by Mr. Triggs as A.A. Travelling Student; measured drawings of Ramridge Chantry, St. Albans, by Mr. Rider Smith (Jas. Brooks Prize); measured drawings of Cromwell House, Highgate, by Mr. A. Bryer (measured drawings prize); sketches by Mr. H. C. K. Hide, winner of the Andrew Oliver first prize, and by Mr. A. J. Roddis, winner of the second prize. Studio drawings of work done in studios were exhibited by Mr. N. C. Bathurst and Mr. C. Martin, who gained respectively the silver and bronze medals in Division I.; by Mr. Trimmell and Mr. H. C. K. Hide (silver and bronze medals in Division II.), and by Mr. J. R. Stark and Mr. J. Hunt, winners of similar medals in Division III. Photographs were lent by Mr. Wontacott and Mr. J. F. Clark, as representing the Architectural Association Camera Club. It may be added that the refreshments, when obtained (the waiting staff was rather inadequate), were a decided improvement on those of last year.

LETTER FROM PARIS.

THE late great painter Meissonier, whose vanity was as great as his genius, would probably have been gratified at the honours paid to his memory. The town of Poissy had already raised, last year, a fine statue to his memory—that by M. Frémiet, an illustration of which has been published in the *Builder*;* and on Friday the 25th a select audience attended, at Paris, the inauguration of the second monument to him, erected in the Jardin de l'Infante, near the Louvre, opposite the Pont des Arts, and facing the monument to Raffet.

The new monument is in white marble. The sculptor, M. Mercié, had at first the idea of representing Meissonier borne aloft on a shield by four dragons. The subscription committee, however, thought that this would have too much the air of an apotheosis, and that the honours of

* In the number for July 6 of this year.



Design for Panel in a Frieze. By Mr. Patten Wilson.

a military triumph could hardly be offered to an artist, however eminent; it was thought that it would be an exaggeration which might give rise to ridicule. Accordingly, the scheme was reduced to a more modest one. Meissonnier is represented in his studio, in a painting-gown, as represented in his portrait of himself exhibited in 1889. He is seated in a large arm-chair in that Renaissance style which he loved so much. Leaning on his right arm, he rests his head on his right hand, in an attitude of meditation, while the left hand, holding the palette, drops carelessly on the arm of the chair. The pedestal, also of marble, is adorned with a trophy formed out of the accessories employed by the painter in his principal pictures of the Imperial epoch; a cuirass pierced by bullets, a helmet, the traditional small cocked-hat of Napoléon, a flag, a sword, &c. The work, executed in a broad and grand style, is powerful and finely proportioned. It seems doubly effective in contrast with the severe architecture of the Louvre, in comparison with which the Raffet monument, with its slender column, has, on the contrary, a somewhat starved appearance.

By way of emphasising its respect for the deceased artist, the Department of the National Museums arranged that the installation at the Luxembourg of the small bronzes presented to the State by Madame Meissonnier should take place concurrently with the official inauguration of the monument. These statuettes, cast by the *cire perdue* process, were modelled by Meissonnier with marvellous talent. There are five of them: two equestrian figures representing *Maréchal Duroc* at the Battle of Castiglione; a trumpeter of the period of Louis XIII.; a little figure of a dancer; a wounded horse which figures in the foreground of the picture of the Siege of Paris; and a design for a mantelpiece for his studio in the Boulevard Malesherbes. These statuettes are temporarily placed among the pictures, but will ultimately have a situation found for them in the sculpture gallery of the museum.

Meissonnier, who possessed remarkable gifts as an animal sculptor, almost always, before painting a picture, made models in wax of the principal equestrian figures. It even appears (and this fact is very little known), that to assist these preliminary studies he got the sculptor *Geoffroy Dechaumes* to construct for him a very careful model of the skeleton of a horse, to a very small scale, the various parts of which were movable, and could be taken to pieces at pleasure. This enabled the painter to build up the model of each horse in the position in which he wanted it.*

* This is surely an interesting commentary on the celebrated definition of genius as "an infinite capacity for taking pains."—E.O.

The monument to the memory of *Emile Augier*, the poet, in the *Place d'Odéon*, was also to have taken place last week, but the ceremony has been postponed to the 4th of the present month. The monument, however, is in its place and almost completed, and one can at all events see that it will not injure, as was feared, the effect of the *Théâtre de l'Odéon*. It is a very simple design, consisting of a column about three metres in height, on a pedestal formed by two circular steps, and supporting a bust of the poet. Around the pedestal are grouped allegorical figures, which, as well as the bust, are the work of *M. Ernest Barrias*.

At the *Parc Monceau*, the monument to *Bizet*, the composer, will soon be inaugurated. It is the work of *M. Falguière*, who is now engaged in putting the last touches to it. It will consist of a large mass of white marble 3 metres in height, rough and simulating a natural rock, with branches of laurel strewn over it, and surmounted by a bust of *Bizet*, to whom a youthful figure of a Muse stretches a palm branch. A girl in Spanish costume, seated at the foot of the block, recalls the figure of *Carmen*. The plinth has been executed under the direction of *M. Chas. Garnier*.

The question of the Metropolitan Railway seems to have got into its last and decisive phase. The Government, which is anxious above all for the success of the 1900 Exhibition, will give up its first scheme, and has recognised the right of the Paris Municipality to carry out the work on its own plan as a simple "local railway" undertaking. This is a great step towards the realisation of the project. The Government demands only that the Municipal Council should consent to the establishment, before 1900, of a prolongation of the *Moulineux* railway as far as the terminal stations of the Lyons and Orleans railways. According to this new scheme, the financial contribution of the leading companies is to be nine million francs, six million in money and three million in engineering work. The junctions with the Lyons and Orleans railways will alone cost 1,500,000 francs each. The Municipal Council will shortly take into consideration the new proposals and the study of the system of city lines which it has already adopted in principle a year ago. This system will include the following lines:—An east and west cross line from the Bastille to the *Gare des Invalides* by the *Place Walhubert*, the quays, and the Boulevard *St. Germain*; a north and south cross-line by the *Gare du Nord*, the Halles, the *Quay Conté*, and the *Quay des Grand Augustins* and the *Place Médicis*; a line from *Rue Reaumur* to the *Gare St. Lazare*, passing by the *Parc Monceau*, following the *Avenue Hoche* and the *Trocadéro*,

and stopping at the viaduct of the Boulevard *Grenelle*.

In regard to the 1900 Exhibition, according to a financial combination proposed by the General Commissioner, and which will presently be before Parliament, the Government proposes to institute next year a public issue of bonds: 20 francs which will guarantee to the subscribers certain advantages. The subscriber will receive the value of his bond in the shape of twenty franc entry tickets to the exhibition. He will also have the advantage either of entry to 10 special spectacles in connexion with it at reduced price, or of transport to it at reduced fares. He will also have a number of chances in important lotteries, among which will be five lots of 500,000 francs each and twenty-four lots of 100,000 francs. It should be added that foreign holders of these bonds will enjoy the advantage of the reduced fares from the moment they cross the frontier.

The Municipal Council, whose session has just opened, have commenced the preparations for two pieces of work long looked for in the artistic world. The first is in relation to the Church of the Trinity, the facade of which has long been in a deplorable condition. The four fine groups of stone, at the base of the campanile, are nearly headless. These groups, representing *Strength*, *Justice*, *Prudence*, and *Temperance*, are the work respectively of *Jacques Maillet*, *Cavelier*, *Craux*, and *Carpeaux*. The last-named is a specially fine production. At a comparatively small cost the sculptures are now to be restored under the direction of a talented sculptor, *M. Roland*. The second operation referred to is the repair of two graceful figures of angels, also much decayed, which adorn the side arcades of the tower of *St. Germain d'Auxerrois*, and which were the work of *Guillaume and Cavelier*. *M. Desvergues*, a former holder of the *Grand Prix de Rome*, was entrusted with the commission.

In regard to the group by *M. Bartholdi*, "Washington and Lafayette," intended for the *Place des Etats-Unis*, it has been decided, in accordance with the wishes of the American colony in Paris, that its inauguration should be deferred till February 6 next, the anniversary of the day on which France recognised the independence of the United States, or perhaps the 27th of the same month, the birthday of Washington.

The Municipal Council has also been occupied about a scheme which, while it will no doubt be a public benefit in one sense, will be a great injury to the effect of some of the Paris streets. The proposal, which emanates from an architect *M. Teulère*, is to construct foot-bridges across some of the more crowded portions of the *Paris*.

ets, where the traffic is not regulated by policemen in the admirable manner in which it is done in London. The Paris "Gardiens de la nuit" are notoriously very much at sea and very little use to anyone in the midst of an unmanageable crowd of vehicles. The bridges, it is posed, should be of steel and wrought-iron, footway of wood, the supports of cast-iron. The Council decide in favour of the scheme, the first trial of it will probably be made at the Hotel de Rue Lafayette and Rue Drouot, known for the Parisian public as the "Carrefour des des," in consequence of the numerous accidents which have happened there.

Speaking of Rue Drouot, we may mention that competition for the new buildings in that street for the *Figaro* journal has been decided. The jury has awarded the first premium to M. Aud, the second to M. Depertthes, and the third to MM. Bluyens and Chesnay; an extra third premium to MM. Schoellkopf and Boutrou, with honourable mentions to other competitors. Four premiated designs become the property of *Figaro*, and will serve as the basis for a plan to be carried out, in accordance with programme, by M. Sauffroy.

Viollet-le-Duc, the son of the great Viollet-le-Duc, who has directed very ably the post of Monuments Historiques, has resigned office, and has been replaced by M. Lucien, an eminent writer on art. The death is announced of M. Jules Paulin, to whom the Société Centrale des architectes awarded, in 1878, the medal founded the same year by M. Paul Sédille, in favour of industrial art. Jules Paulin belonged to a race in which the best traditions of work in architecture had been long hereditary. He was aided by architects as a valued collaborator in application of ceramic work to architectural decoration, and was remarkable both as an artist and a man of science. He was a former member of the Tribunal of Commerce of the Seine, was President of Union Céramique of France, and was created Chevalier of the Legion of Honour in connexion with the Exhibition of

SIGN FOR PANEL IN A FRIEZE.

His graceful design was worked out by the artist Mr. Patten Wilson, in a coloured drawing sent at this year's Royal Academy. The design is so simple as to require no explanation. The original drawing the foliage, though essential in design, is treated with a comely approach to the natural green of vegetation. The figure has on a blue mantle, and is semi-transparent where it falls close to the figure, as over the right leg, but for the part showing as a tolerably strong blue. Owing to the well-known tendency of blue to fade and probably disappear in photographing, the dress of the figure thus appears in the reproduction as light against a darker background, whereas in the original drawing it shows as lighter than the background. It seems right to mention this unavoidable alteration of values, though in a general sense the translation into black and white has not altered the essential character of the design.

ABOUT SOME EXHIBITIONS.

The managers of the Institute of Painters in which the exhibition is now open at the Pica-Galleries, seem at last to have seen what no one else has seen for a good while back—their exhibitions have hitherto shown too much of quantity and too little of quality; and they have wisely reduced the number of pictures hung, and not attempted to cover the walls up to the cornice, they have succeeded in getting, even among this reduced number, a better general level of merit than on previous occasions. Among the larger pictures John Collier's illustration of the Scottish on Halloween (82) standing with her back to the spectator to see the face of her future husband and look over her shoulder in the glass, is successful in every respect; the girl's tensed attitude, clinging to the chest of her lover and half drawing away, and her scared face in the glass, are dramatically conveyed. There is, however, to be an inaccuracy in the rendering of the superposition, because, properly speaking, the girl shows herself as the experimenter is in the act of eating an apple before the glass, whereas the apple lies uncut beside her; but this is certainly not to do so well for representation in painting. The President sends a larger work than usual, "Fortia" (281),

as fine as usual in colour and costume, and we regret to say, not more interesting than usual in the painting or expression of the face; he also contributes a carefully-executed landscape, "Newhouse Park, St. Albans" (180), with the house in the background, which looks rather like a commission for a topographical picture. Mr. T. B. Kenington's large work, "The Lure" (361), a painting of a nude siren sitting among the wreck of her human victims and with a shadowy skeleton behind her, is rather whimsical in conception, shows, at any rate, an excellent piece of painting and drawing of the figure. These are the prominent figure pictures; among the smaller ones M. Fantin-Latour's "L'Aurore et la Nuit" (126), is a fine bit of colour; M. Chevallier Tayler has two good life-sized portraits of ladies (118, 131); Mr. John R. Reid's "The Bread-Winner" (317), a dancing-girl rehearsing before her parents in a corner of a tea-garden, is a clever and spirited work, and Mr. Cameron's "Making Friends" (332) is a very pretty rustic idyll, to which a certain extra interest attaches on account of its individuality of style. There are other figures of the genre type, by old and well-known contributors, which are of average interest. But in landscape the exhibition is stronger, and contains some very fine works. It will interest many who have appreciated Mr. R. W. Allan's fine and broad style and powerful effects of colour in works of a different class, to find him in "Evening" (11) indulging in landscape pure and simple, and exhibiting in it the same fine qualities which he has shown in his town subjects. Mr. F. G. Cotman, in "The End of the Harvest" (70) recalls to us some of the best works of his father; in "The Water-cart" (79) Mr. Thorne Waite shows a broader and more powerful style than in his usual beautiful but rather sentimental work; Mr. Wimperis recalls Constable in "The Way Across the Fields" (213); among other landscapes which should be looked at are Mr. Joseph Knight's "Sandhills" (51); Mr. Johnson's "Markfield Mill" (63); Mr. Pickering's broad study of wooded landscape (97); Mr. Claude Hayes's "Morning in the Meadows" (125), an interesting attempt at a very difficult feat, the representation of a misty morning with a profusion of dew on the grass; Mr. Herbert Marshall's "The Embankment, Winter" (143), a fine repetition, on a larger scale than usual, of an effect he has painted rather often; Mr. Wetherbee's semi-decorative little picture called "A Spring Dawn" (190), interesting from its special treatment and idea; Mr. R. D. Reid's "A Pastoral" (203), a leaf out of Mr. H. W. B. Davis's book; Mr. Cotman's "Shades of Evening" (203); Mr. Hope M'Lachlan's "A Midsummer Sea" (247); Mr. R. W. Allan's picture of desolate "Cromarty" (319); Mr. John R. Reid's "Spring's Delights" (333), a real spring landscape—some others in the Gallery which are called "Spring" do not by any means suggest that season of the year;—Mr. Jas. S. Hill's "Near Deal" (367); Mr. Hope M'Lachlan's "Night" (384), a very powerful bit of effect; Mr. J. Farquharson's carefully-studied painting of "Ice-worn Rocks, Loch Hourm" (396); Mr. Johnson's "Corrie na Creach, Skye" (447); and Mr. Joseph Knight's "Cerrigan Head" (475), of which the sea is hardly a success, but the rocks are grand.

All these are landscapes worth looking at, and that is a pretty good list for one exhibition, as things go. Of architectural subjects there are not very many, and hardly of the first order; we may mention Miss S. Stanley's "Exterior of St. Mark's" (72), Mr. Fulleyslove's "Columns of St. Mark's" (169), and Mr. Logsdall's "Church of the Misericordia" (179), the best of the three.

At the Dowdswell Galleries in Bond-street is a collection of water-colour drawings by Mr. Wimperis, chiefly in and about the New Forest; drawings for the most part on a small scale, but admirable examples of that old broad English water-colour style of which Mr. Wimperis is one of the last remaining practitioners. The exhibition contains sixty-nine drawings, all in a good style. Among those which are especially good may be mentioned "The Path by the River" (1), "A Country Lane" (14), "Evening Shadows" (30), "A New Forest Upland" (36), noticeable for its fine stretch of distance; "The Miller's Cart" (49), a beautiful bit of colour effect; "A Glade at Highwood Heath" (57), with the effect of the red heather beautifully conveyed; and a small drawing "Moor at Inkpen" (53), which is grand in character—a great landscape-painting on a small scale.

Mr. McLean's gallery is of rather partial interest; the best works in it are apparently old

ones. Saint-Pierre's "Diana" is a noble work as regards figure-drawing; the dogs also are splendid in character and spirit, but one's pleasure is spoiled by the dead colour and want of texture of the flesh. It belongs, in this respect, to the practice of a past school; Rondel's bust, entitled "The Blonde," near it, is an effective contrast in this respect, though a quite inferior work otherwise. We are glad to meet again Mr. Peter Graham's fine landscape, "Wind and Rain," exhibited some years ago at the Royal Academy under the simple title, "Wind"—possibly the rain has been put in since. Sir E. Poynter's half-length "Barine," a classic lady crowned with crimson flowers, is, we fancy, a work of a good while past. The exhibition contains good examples of the work of Clays, Eugène de Blaas, Mr. Wimperis, Madame Dieler, &c.

Of the Society of British Artists we fear there is not much to be said; it does not improve. There are some pretty good landscapes; Mr. E. A. Fellowes Prynn contributes a good piece of decorative painting, "Ecce Ancilla Domini," very hard in style certainly, but that is of less consequence in decorative painting; the ex-Secretary, Mr. Robert Morley, continues his animal studies successfully, as in "Defied"; Mr. Wyke Bayliss contributes architectural subjects which are well-drawn and correct in detail, but in a style which does not attract us; Mr. Arthur Mead gets a good effect of "open-air" in "Sea-Urchins"; Mr. Reginald Smith and Mr. Gouldsmith show two or three seascapes in which there is a good deal of movement; and a screen of landscape-sketches, travelling sketches apparently, by Sir F. Leighton, forms a special feature in the collection.

Probably the chief popular interest of the week in exhibitions will centre in the Society of Fine Arts Gallery, in which are to be seen the pastels of Mr. E. A. Abbey, and the "Trilby" studies of M. du Maurier. In regard to the pastels, Mr. Pennell, in a rather conceited preface, which has a kind of tune of "I admire all these and therefore every one must" about it, sums up certain advantages of pastel as follows:—

"I do not know how old the art of pastel is, nor do the various authorities whom I have consulted. But the art of drawing with coloured chalks is as old as the art of painting itself. In fact, a pastel is a chalk pencil made of various colours, and of varying degrees of softness. Those employed to-day are probably the most delicate and sensitive of artists' mediums. They are pencils of colour and of every variety of colour which the artist wants. There is no mixing them with oil or with water, for they are mixed. There is no waiting for them to dry and then seeing what unexpected effect they will present, for they are dry. Once they are put upon the rough-toothed coloured paper, they stay there just as they are. There is no varnishing to bring out the colour, and no restoring is wanted, since the colours never fade. There is no oil in them to turn them black, nor will the sunlight bleach them out. One has but to see the chalk drawings of the old masters to realise that very often the colour has resisted time and the vandal more successfully than the paper. . . . Some people seem to fear that pastels will crumble or fall to powder within their frames. Even those by Lotard, which are worked far more solidly—the colour loaded up on them than Mr. Abbey's, reveal no evidence of such a fate. It is scarcely possible that they were fixed, and yet they do not crumble. To-day, a perfect method of fixing the colour to the paper has been perfected, and there is not a doubt that these creations of Mr. Abbey's will last as long as the paper upon which they were drawn."

We have quoted this evidence, as it may be interesting to those who think of trying pastel. Mr. Pennell does not touch on the obvious drawback—that your range of colour is somewhat limited, and that graduated colour is a difficult achievement. Look at the foliage background in Mr. Abbey's "Summer Afternoon" (8), for instance, with its crude blue shadows, and see if it does not a little suggest landscape in wool-work. But most of Mr. Abbey's pastels depend mainly on figures for their interest, and for the rapid realisation of ideas in the conception of figures pastel has great advantages. There is plenty to look at in the Exhibition, as might be expected; a charming vivacity both of effect and action in "An Impromptu Dance" (7); a beautiful bit of figure and drapery design in "The Dancing Girl" (13); delightful humour and character in the representation of Bob Acres and David (20) looking at the "challenge" epistle, and in the perfect realisation of "Mr. Croaker" (22). "Miss Lydia Languish" (19) is too serious and too sensible for the character. There is a fine solidity of effect in the half-length figure, entitled, "In a Garden" (39), which stands out so solidly from the back-

ground. The collection generally is worth study, both for the humour, the character, or the grace of many of the figures, and the examples which it affords of the capabilities of pastel.

In the adjoining room M. Du Maurier's studies for the illustrations to "Tribby" will no doubt attract great attention, and are of more interest in an artistic sense than we had quite expected. They are not the facsimile ink-line drawings for the illustrations as appearing in the book, but the pencil studies made, on a larger scale, for the separate figures in each illustration; the book-illustration with its title is introduced into each frame, as an explanation of the separate pencil studies. These show what care the artist has given to the preparation of these small illustration groups, and form a collection of most interesting studies of human character and attitude. The run which there has been on the book itself—save that it is the work of a very popular artist—we do not profess to comprehend; "Tribby" appears to us to be a collection of excellent materials for a novel, jumbled together by a writer who has no perception whatever of literary construction and perspective; and it is odd that artists should not see that writing, as far as literary form goes, is a special art just as much as designing, and cannot be attained without natural perception aided by special study. But the studies for the illustrations to it are very well worth attention.

MODERN BUILDING DESIGN.

ON the 26th ult. the first of two lectures on the study of architecture, arranged by the Technical Education Board of the London County Council, was given at the Central Art Department of the Board, Bolt-court, Fleet-street, E.C., by Mr. W. R. Lethaby, who took as his subject, "Modern Building Design."

Doctor Garnett, in introducing Mr. Lethaby to the meeting, said that there seemed to be points in which it was thought that the education and thereby the practice of the architect might be improved, and in his opinion architects' pupils might with advantage be brought more into contact with the workman than they are at present.

It had been said very properly that the architect was the chief workman on a structure, and therefore the architect should take his position as such. The education of architects' pupils might be improved if those pupils were brought more closely into touch with work in the workshops, and to that end an attempt had been made in London to secure facilities for them to enter the workshops in the technical institutes and Polytechnics, so that even if a pupil did not learn much about the actual use of the tools, he would at any rate have the run of the shops, get more in touch with the workmen, and see the operations in connexion with a piece of work from beginning to end. Two or three technical institutes had already come forward and offered facilities in this direction.

The following is an abridged report of the main points of Mr. Lethaby's lecture. He observed that his lecture had been occasioned by the following facts:—The Polytechnics had from the time of their foundation been giving instruction in the building crafts, and it seemed that those crafts could only be dealt with in a broad and satisfactory way by being related to their common centre: the art of building considered as a whole. There were at present in the Polytechnic art schools and construction classes a large number of students of architecture, and his chief purpose was to suggest to those students and others that the practical workshops in masonry, joinery, &c., conducted at those centres would form a valuable basis for their studies.

They were there to think over the subject of building as one of the arts; and allowing that modern building was not now a subject of joy to the workers or the beholders, to consider whether this was a temporary transitional state or an inevitable one. He could not set out a view of building design four-square with all the facts. He could not come to any view as to what the word architecture was now supposed to involve, therefore would start with the less ambiguous word building. The word architecture had been most in vogue in times when beautiful building was least practised. "Ornamental building" would not serve as a clear definition; "expensive building" might, for they must find a place for the work on the Abbey and parish churches of St. Albans. But passing by some farmhouse built within the century or even some present-day cart-sheds and field-gates, thatched ricks and hay-wains, we realised that this poor but essentially interesting artisan work was really the latter-day remnant of the crafts that built our

ancient towns, churches, and manor-houses. The gifts and devotion required to carry out a law courts, or a modern large school or hospital, appeared to him to be almost boundless. Wren's problem in St. Paul's was a simple one by comparison. But the unequalled skill of modern architects had not achieved a noble school of building, and true architecture was now non-existent. It was the gravest mistake to foster the idea that there was a sort of building called "architecture," superior in kind to ordinary building; the serious problem was how this "ordinary building" might be well done, for without that as a basis no higher building or "architecture" would be possible. There was no blame to be attached to the architects, who did for the public exactly what the public required, in a very capable way. But we had to consider how it was that the art of architecture had failed to interest intellectual men of the world from the early days of the Renaissance. The remarkable awakening of interest in industries as arts and in building as a phase of life during the last half century, had resulted in the discovery that art was as much a method as an end—machinery had shown us that. The more intellectual interest in building, and inquiry as to the true groundwork of the art, was linked as cause or effect with a better understanding of Gothic architecture. Hugo said, "Co-operative human intelligence is totalised in these works. The time was the architect, the people was mason." We might draw pointed arches and traciced windows and call them Gothic designs, but true Gothic architecture was built with Gothic mortar. Revived masons' marks, careful "accidents" in setting-out, sham time-stains as in new "thirteenth century" glass, were all miserable subterfuges; how were we to get our walling, our mortar, and a new spirit. Carlyle's father gloried in doing good work as a mason at a few pence a day. Thoreau said, "What of architectural beauty I now see, has gradually grown from within outward, out of the necessities and character of the dweller who is the only builder, out of some unconscious truthfulness and nobleness without even a thought for the appearance; and whatever additional beauty of this kind is destined to be produced will be preceded by a like unconscious beauty of life." Mr. Ruskin said, "These pediments and stylobates and architraves never excited a single pleasurable feeling in you—never will to the end of time."

All good architecture arises out of good and simple domestic work." Mr. Morris said, "The art that is to come will not be an esoteric mystery shared by a little band of superior beings; it will be a gift of the people to the people, a thing which everyone can understand and everyone surround with love. . . . A building is made up of millions of hammer-strokes, chisel-strokes, and movements of the hand. Because a man sits in an office and makes a design, it does not follow that you get a fine building." In France, where, for two centuries, there had been a magnificently appointed academic system for teaching what was called architecture, the result was acknowledged to be dry, futile, and dead.* Vital beauty could only be present in building when the character of the design sprang out of the contact of tools and material, and was not the result of compilation in codified scholarship. What was taking place around us was the re-establishment of several crafts under the personal conduct of the designers. The expert in the arrangement of highly-specialised buildings like the hospital, the club, or the asylum, would have the co-operation of master-builders and craftsmen, experts in workmanship and expressive design, and a very large part of ordinary building would be done by them out and out. Here they had a basis for a broad school of experimental craft which would be in touch with the whole of building. The architect-arranger must then content himself with arranging and give up ornamental detail, calling on the free sculptor, painter, metal-worker, and so on for all accessory arts. All along the line attention to design was being incorporated with technical instruction, and the system would certainly not arbitrarily stop short of the building crafts. The time was coming when such architects as felt drawn to the mere art of building would not think there was any difficulty or degradation in such a course; they would just build. The thought that the development of the designer of building work (as apart from the worker) has not been a mere passing phase but is in the nature of

things modern, was largely based on a misconception. The point was, were designers developed from workers, or was the designer to be produced in quite a different way by substituting a knowledge *about* work for a knowledge *of* work? They were probably agreed in wishing to make a building more interesting by means of the workmen becoming more capable and more interested, and all would allow that building designers should be brought into contact with materials, and methods of working them, as much as possible.

What did the past tell us in regard to the view that experiment with materials was the only basis for a positive style of building? Mr. Mahan said of Athens and her artists, Here, as in other great epochs, art and trade went hand-in-hand; the artist was not a grandee but a tradesman."

Rome, Ephesus, and Constantinople the guilds the workers became powerful, and gave craft organisation which persisted down to the late Middle Ages. The designers and builders of cathedrals were graduates of craft colleges or guilds. At St. Stephen's Chapel at Westminster "Master Thomas of Canterbury, master mason" was engaged at a shilling a day, or twice the wages of an ordinary mason. In the present day the first thing we needed was a wider general understanding of what went on in the workshop.

In the Middle Ages an abbot or a soldier would very likely call in a master mason, and say, "do you think you could build a church, or a castle, like so-and-so, only bigger and nicer?" The Renaissance, which freed Learning and made Science experimental, set Art to grimace in a pillory. Wren, the greatest mind that had dealt with building since Michelangelo, saw exactly what was to be got out of the Renaissance box—bricks, and the personal humanity and gracelessness that showed under the bigwigism of the style and lighted up his science and scholarship were marvellous. The "last of the Romans" in England, he closed that gate as effectually! Michelangelo did in Italy; but at St. Paul's with admirable craftsmen to help him, position was rather like that of a Medicean master. After Wren came the drop-scene of Vanbrugh and the pedantry of Chambers.

It took scholarship two hundred years to destroy all building tradition, and then we had Pugin who, like Seth in the apocryphal gospel, retraced the steps of the fallen on the blighted ground and looked wistfully through the gates of the Eden.

He would pass over the unworthy things which draughtsman-designers had now set themselves of imitating styles neither imaginative nor scholarly. The cry was for "style," and the assumption was made that architecture was made up of features, or that it would be more possible with new materials. Not this or that material, every one, was the best; the question of materials was only an economic one. The mistake lay in the endeavour to design style. Style was only a way of doing things, and as inseparable from activity as faith from works. As physical beauty was an index of health and natural living, so was an index of natural and stable ways of doing work. The common habit of separating architecture into art and science without explaining what was meant by either, was extremely harmful. The scientific side was supposed to be knowledge of books on construction, the artistic a knowledge of books about art, not considered as art, but as history, and so "art" led off to the pyramids, the catcombs, and so on.

Literature and art, *saying and doing*, were two ways by which men embody their souls; act, lie, "Style, that is the man," ran the French saying. That turgid piece of clever vulgarity, Blenheim was only another of Vanbrugh's plays, and the mind of Wren was open to us in St. Paul's. As we passed along the streets and read the faces of the buildings it was not because of mere shapes and colours that we made this fuss; we wanted sympathy with the men behind, if they were only risk a smile in their work. Those who bespattered their buildings with thrice-boiled slime and crawling horrors they called ornamentation did it because they liked that kind of thing.

We could not understand architecture without learning to read it, but though everything led to this, he did not think a builder could or should foresee the exact expressional result of his work it should be a growth, not a creation. The expression of an old castle came by the way; its machicolations were not designed to frighten but they *did* frighten. It was with a building, with a person; of one who carefully designed his expression; of one who carefully designed his "Expressionism," however, might best of all what should be sought in design, and building could only be interesting when there existed wide-spread ability to read its expressions.

* By whom? The late Mr. Hamerton, who knew something about art, gave it as his opinion that, in France alone, was architecture still a living art. M. Daudet, whom Mr. Lethaby cited in a quotation which has already appeared in our columns, certainly had far less right to speak on the subject than Hamerton.—Ed.



results. No doubt through association, a church, even now, looked very like a church, a railway station like a station, and a gin-palace terribly like a gin-palace. The true mission of architects was by imaginative insight to lift these ideas themselves to nobler issues. The points he had endeavoured to suggest might be summed up as follows:—(1.) That all buildings carry their characters written on their fronts. (2.) That students of architecture must learn to read these documents, questioning the right to exist of this that so-called ornament or feature. (3.) That reading was proper criticism. (4.) That there are only two purposes for a building, service and delight, and that instructed pleasure could only be derived from a building when it fulfilled certain positive conditions. (5.) That there was now no neutral interest in building, because design was national and workmanship not pleasant. (6.) That those, not architects, who had taken the trouble to think about building, sided very plainly at they had no pleasure in us. (7.) That there were only two methods of design possible, the experimental work of an artist thinking in terms of materials, or the re-combination on paper of the results of old artisan work. (8.) That small handiwork knowledge was so far better than none, but generally that a fine work of art could only be produced by a workman. (9.) That beauty was not a luxury, but was inseparably and up with quality. (10.) That we who were fishily interested in beauty could not content ourselves with less than the endeavour to bring back beauty to all building, and thereby beautify earth and not desecrate it.

Mr. Lethaby's second and concluding lecture will be delivered to-day (Saturday) at the room Bolt-court, at 3.30 p.m.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, at the County Hall, Spring Gardens, Sir Arthur Arnold, chairman, presiding.

Advertisements on Hoardings.—The adjourned report of the Works Committee contained the following paragraph and recommendation:—

"The specification for the erection of Whitefriars re-station does not contain any clause prohibiting advertisements on the hoardings which will be erected to enclose the works. Our manager therefore prepared his estimate on the assumption that the Council would receive a large sum for letting the right of advertising on the hoardings. We have obtained an advantageous offer which, if the Council authorises us to accept, will considerably lessen the cost of the work. We recommend—

That we be authorised to let the right of advertising on hoardings about to be erected in Carmelite-street and in Carpenter-street, during the building of Whitefriars re-station."

Sir John Hutton moved the following amendment:—"That the recommendation be referred back with instructions to the Committee to amend its estimate, excluding the consideration of letting the hoarding for advertisement purposes."

Dr. Longstaff seconded the amendment.

Sir Blundell Maple said that he should support the recommendation of the Committee in the interests of the ratepayers. The Council might be able to obtain five or six thousand pounds a year in this way, which would help to reduce the rates.

Mr. W. Steadman supported the recommendation, remarking that advertisements like those of the Aquarium, for instance, were very much more pleasant to see than bare hoardings. He hoped that at the Committee's recommendation would be tried, and that London would soon become one large picture-gallery.

Mr. Beresford Hope said that he had lived for seven years in front of a large hoarding, and it was as a matter of interest to him to see the changing pictures. The amendment would mean taking up five or six thousand pounds from the ratepayers' pockets annually.

Mr. E. Jones said that, as the Council did not allow advertisements on new bridges, it should be consistent and prohibit them on its own hoardings. Mr. Roberts supported the amendment, and referred to some forms of public advertising as monstrous products of industrialism. He hoped the Council would not adopt a lower standard than did the City on that question. It was a deplorable fact that sometimes pieces of vacant land were acquired merely for the revenue to be derived from advertisements on hoardings surrounding them.

Mr. Cosmo Rose-Innes reminded the Council

that many of the modern advertisements were very beautiful.

On a division, the amendment was defeated by 80 votes against 30.

Mr. Strong moved that the following words should be added to the recommendations of the Committee: "And that, in view of the question of principle involved, the whole subject of advertising on hoardings in connexion with the Council's works be referred to the General Purposes Committee for consideration and report."

With this addition the recommendation was carried.

The Wandsworth Technical Institute.—The Technical Education Board reported that at the Wandsworth Technical Institute the skating-rink, known as St. George's Hall, has been converted into laboratories, workshops, and class-rooms, under the superintendence of Mr. E. W. Mountford, F.R.I.B.A., at a cost of about 900*l*. A technical day school for boys has been opened, and is conducted as an organised science school. In the evenings classes are held in carpentry and joinery, staircasing and handrailing, brickwork and masonry, machine drawing, physics, chemistry, mechanics, physiology, hygiene, and other subjects. The Board also reported that at the Battersea Polytechnic three new workshops have been erected. These workshops will be used for carpentry and joinery, smiths' and foundry work, and electrical engineering. Simultaneously with the erection of these new buildings the large workshop adjoining the women's department, which was formerly used for carpentry and joinery, has been converted into a laundry.

Sanitary Science.—The Board also stated that the training of sanitary inspectors and others in sanitary science is receiving careful attention, and a joint Sub-Committee has been appointed by the Board and the Public Health Committee of the Council. This joint Sub-Committee is considering the applications which have been received from institutions interested in the teaching of sanitary science, and in the conduct of examinations for sanitary inspectors, and in order to secure unity of action is in communication with the Local Government Board on the subject.

London and Provincial Labour.—Mr. Holland moved:—

"That, while not desiring to restrict the general discretion of its Committees, the Council is of opinion that they should when inviting tenders for work (provided that such work can, in their opinion, be as well done in London as elsewhere) invite such tenders in the first instance only from firms having their works in the County of London."

Mr. Steadman seconded the amendment. He said that he was not in favour of promoting a contractor's ring in London, but he believed in giving London work to London workmen.

Mr. J. Burns, M.P., opposed the motion, and in doing so said that the motion was reactionary and retrograde. If it were carried, it would result in harm being done to the quality of London work and to the real interest of London labour. If the motion were passed, he believed that a ring would be promoted among London contractors, and work would be sent secretly out of London and would be done in the provinces at a low rate of wages.

Lord Farrar said he was in entire sympathy with Mr. Burns. One result of the motion would be to deprive London of some of the best work of the country.

Mr. Ward said one result of the motion would be that the Works Committee would have to get all its materials in London and all its work done in London, while outside builders would be free to go to the country. How, he asked, could the Committee compete with the builder under such circumstances?

The motion was ultimately lost, there voting for it 26, against 68.

Workmen's Dwellings and Lodging Houses.—Mr. Corbett moved, "That no further building, either of workmen's dwellings or of lodging-houses, be undertaken by the Council, seeing that such operations result in loss to the ratepayers, and by checking private enterprise tend to diminish instead of to increase accommodation for the working-classes."

The motion was opposed by Mr. Bruce, who pointed out that, so far from a loss, the Council's last buildings were showing a profit; and after a short debate the motion was rejected by a large majority.

Municipal Crematories.—On the motion of Mr. Organ, it was referred to the Public Control

Committee to consider and report as to the advisability of power being given to local authorities to provide crematories.

The Council soon after adjourned.

DURHAM COUNTY BUILDINGS COMPETITION.

MESSERS. PHILIP TREE AND IVOR PRICE, who have been acting as secretaries for those competitors who wished to protest against the procedure of the Durham County Council in this competition, have sent the following letter to every member of the Council:—

"4, Ludgate Circus, London, E.C.
October 26, 1895.

DURHAM COUNTY COUNCIL BUILDINGS COMPETITION.

SIR,—At the quarterly meeting of the County Council, to be held on the 6th prox., you will be asked to give your final sanction to the erection of new county buildings, according to plans prepared by Messrs. Barnes & Coates, of Sunderland. Before giving your consent, we would respectfully suggest your receiving a detailed report from the Building Committee, giving reasons why these gentlemen have been entrusted with the work. Their design, submitted in the open competition inaugurated by you, was not considered by your assessor, Mr. Vickers Edwards, of Wakefield, as even one of the six best, and yet they were awarded the second premium. This action was quickly followed by their being instructed to prepare working drawings for carrying out the work. The injustice which all architects, and we competitors in particular, complain of, is that the authors of the first premiated design, Messrs. Cooksey & Cox, of 4, Adam-street, Adelphi, London, W.C., have been unfairly deprived of their honourably won commission of carrying out the work, and that the gentlemen who were awarded the second place by your assessor have never been paid their premium, neither have they received any other recognition, while the carrying out of the work, which we were all led to believe would follow the first premium, has been given to a local firm who had no claim on it whatsoever.

The Committee's contention, that having paid for the first premiated design, they have nothing more to do with its authors, is a slur upon the profession at large, as no architect of repute would entertain the idea of competing merely to obtain a premium, their aim being to win and carry out their design. A protest from the Royal Institute of British Architects is being forwarded, which we hope will be read before the whole Council.

We now enclose a copy of the protest we competitors have sent signed by all the prominent men we know of who submitted designs.

The authors of the first premiated design and ourselves intend staying at the Rose and Crown Hotel, Durham, from the evening of the 2nd to the 7th prox., and we shall be pleased to supply any further explanation or details.

We are, Sir, your obedient servants,

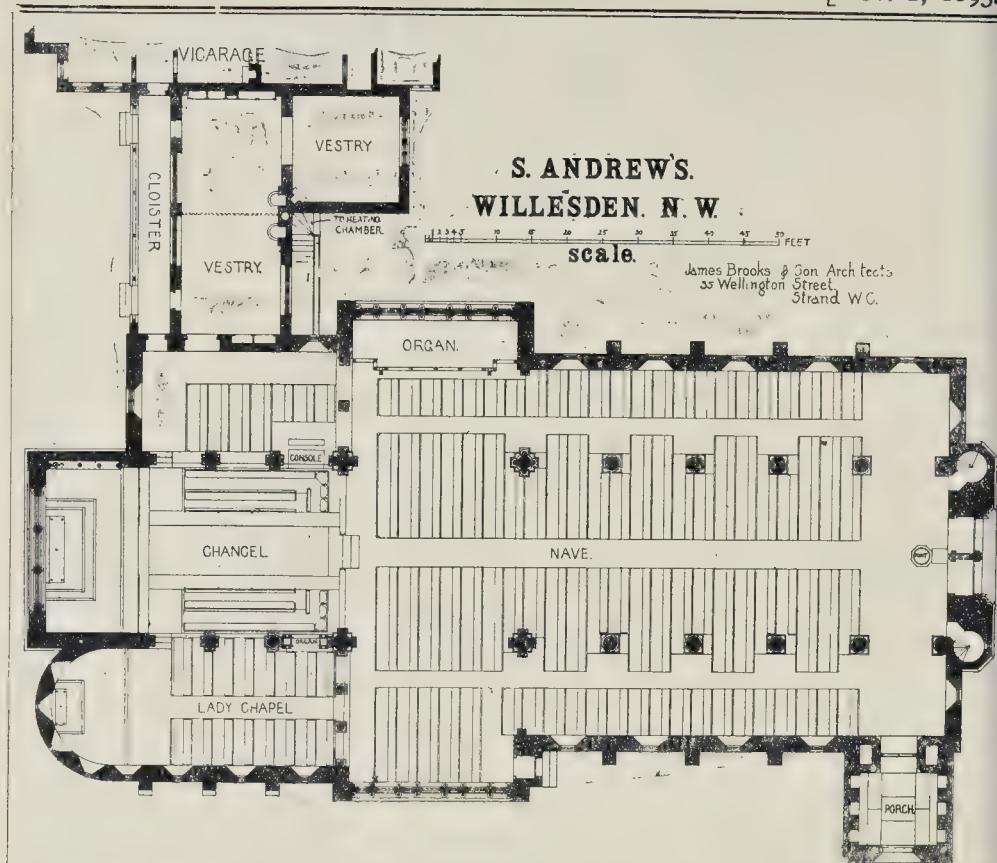
PHILIP TREE & IVOR PRICE,
Hon. Secs. to the protesting Competitors."

This is a spirited protest, and it will be of some interest to see what reply it elicits from those to whom it has been addressed.

A NEW SYSTEM OF ELECTRIC TRACTION.

THE Westinghouse Electric and Manufacturing Company is introducing into this country a system of electric traction which deserves careful consideration. There are no overhead wires as in the trolley system, which at the best can only be considered as a temporary arrangement, adopted for want of a better, and there is no slot either open or closed with a flexible cover as in conduit systems. The only difference in the outward appearance of the lines from that of an ordinary horse tramway is that about every ten yards there is a group of three rounded metal studs, each of which is about $\frac{3}{8}$ in. in diameter and three-eighths of an inch high.

When no car is passing over them they are disconnected from the underground mains, and it is impossible to get a shock from them, and nothing would happen if metallic connexion were established between any of the studs. Underneath the cars are three metallic bars which establish rubbing contact with the studs. Two of these are connected with an underground electro-magnetic switch, which, when actuated by a current coming from a battery of three chloride cells carried by the car closes the main circuit. The other stud carries the current to the motors, and it is returned through one of the former studs. There are slight modifications of the system to suit different conditions, as, for example, returning the current by the rails, thus reducing the number of studs in a group to two. There



are two motors in each car, and they are controlled by a "series-parallel" controlling-stand, which is a model of ingenuity. By turning a handle the motors are started, with their fields and armatures in series, thus avoiding a sudden start; on turning it still further the resistance is diminished, until, finally, the two motors are in parallel, and are then working with high efficiency. At first sight it would seem that this system, involving as it does a large electro-magnetic switch about every ten yards, would be a costly one to construct, but the company say that its cost is about 20 or 30 per cent. less than existing conduit systems, and that the subsequent loss due to leakage is reduced to a minimum. At Pittsburg three miles of rails have been constructed on this principle, and at Washington, one mile, so that practical experience has been had of its working. At their offices in Victoria-street, Westminster, they are exhibiting a beautifully-finished working model tramway on this principle, which shows exactly how the "feeders" are laid, and how the switch works when the car passes it. They state that when applied to underground railway work, a speed of forty-five miles an hour can be attained, which is easy to believe after seeing the rate at which the model cars round the room.

Illustrations.

DESIGN FOR CHRIST'S HOSPITAL SCHOOL, HORSHAM.

THE general plan of this building, some of the detailed plans, and views of various portions of the separate buildings were given in our issues of June 16 and June 23, 1894. The design was described at considerable length in our leading article of June 16, 1894, as well as in a formal description from the architects in the succeeding number of this journal.

The present view is the large general perspective showing the *coup d'œil* of the whole group, which was prepared for and exhibited at the

Royal Academy Exhibition of this year. At the time of our previous illustrations of the design there was no large or complete perspective view of it made, only a slight sketch to give a general idea of the grouping of the buildings. The present drawing supplies what was unavoidably wanting in the former illustrations. It is unnecessary to repeat the descriptions of the scheme which have already been given under the dates referred to above.

The architects, as most of our readers are aware, are Mr. Aston Webb and Mr. E. Ingress Bell. The execution of the scheme seems still to be adjourned *sine die*; but we hope that it may be ultimately carried out, both for the sake of the architect's and in the interests of the public, as we believe it would turn out to be the best-planned large public school in England.

ST. ANDREW'S, WILLESDEN.

A SMALL view of this church, as proposed, from the east end, was given in our issue for January 2, 1886. The church has, however, never been completed. It is now proposed to complete it as shown in the present view and on the plan appended.

Since the church was commenced, a vicarage and schools have been built, and also a choir-school. The architects are Messrs. James Brooks & Son.

HALIFAX BANK COMPETITION.

THIS illustration represents the exterior and plan of the design by Mr. Mitchell Withers, of Sheffield, which gained the second premium in the recent competition for a new central bank for the Halifax and Huddersfield Banking Company, Limited, at Halifax.

The estimated cost of the building was £16,000, the amount allowed in the instructions.

An open semi-circular porch leads into a spacious vestibule with curved ends, and columns in various positions lit from a lantern in the top.

The banking hall is a large room, decorated with columns, and lit from both ends and from a central dome. Off the banking hall are accountants', manager's, and sub-manager's rooms, board-room, safes for bullion, plate, and books with spare safes over, waiting-rooms, and lavatories, &c.

On the upper floors are rooms for caretakers, private rooms for manager, and ample store accommodation.

HOUSE AT WOODSIDE PARK.

THE two sketches of this house, recently completed at Woodside Park, illustrate the front and garden elevations: the latter shown in the small drawing. The effect of a frieze has been obtained in this by the natural grouping of first-floor windows with their shutters under the solid eaves, which are continued round on all four sides of the house.

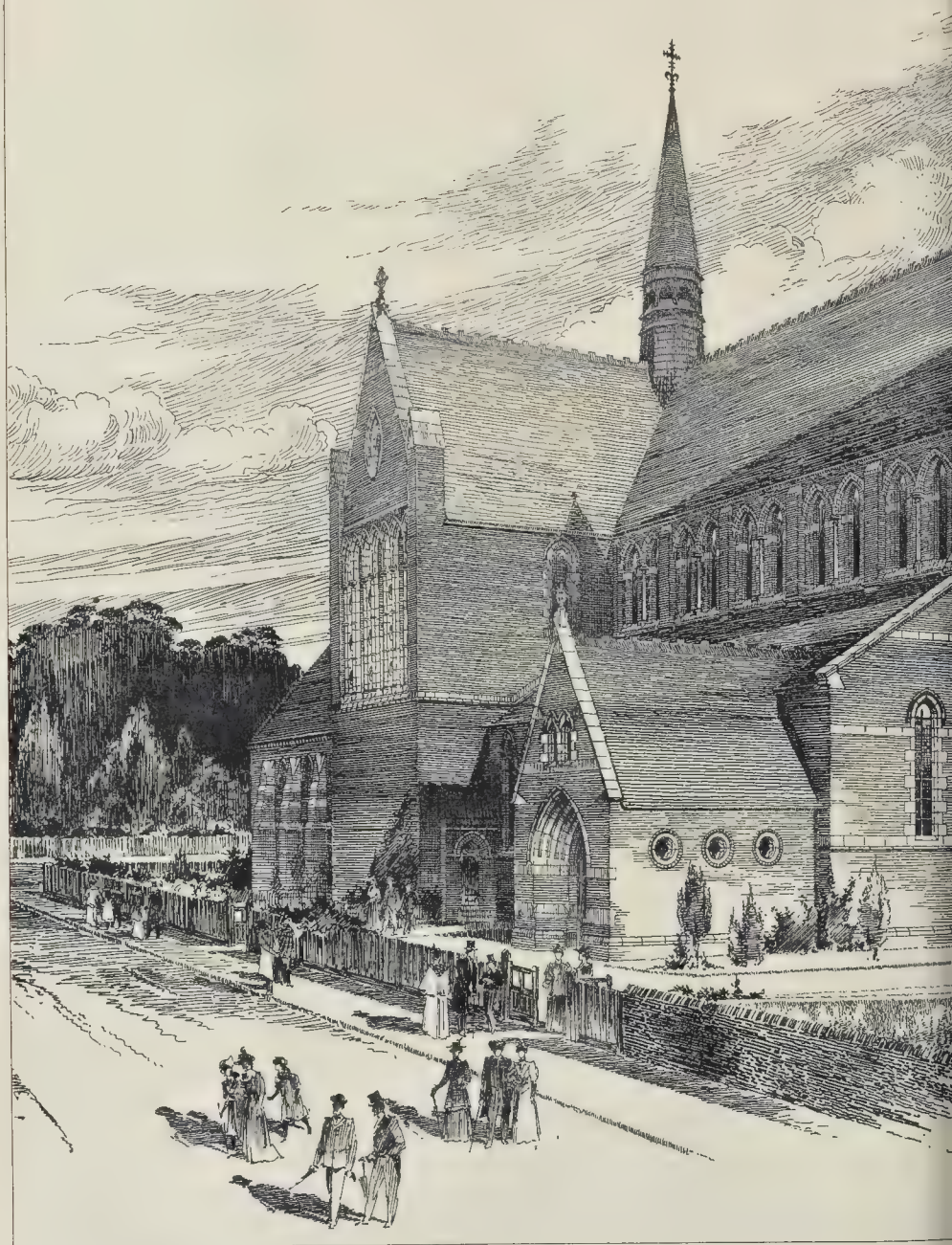
The bay windows above the sill are polygonal on plan, and the whole of the external woodwork, with the exception of the oak doors to the front porch, are painted white. Red bricks and tiles of a deep colour have been employed. The design is by Mr. W. T. Walker, and the house has been erected by its owner and occupier, Mr. James Chapman. The drawing was exhibited at the Royal Academy of this year.

ARCHITECTURAL SOCIETIES.

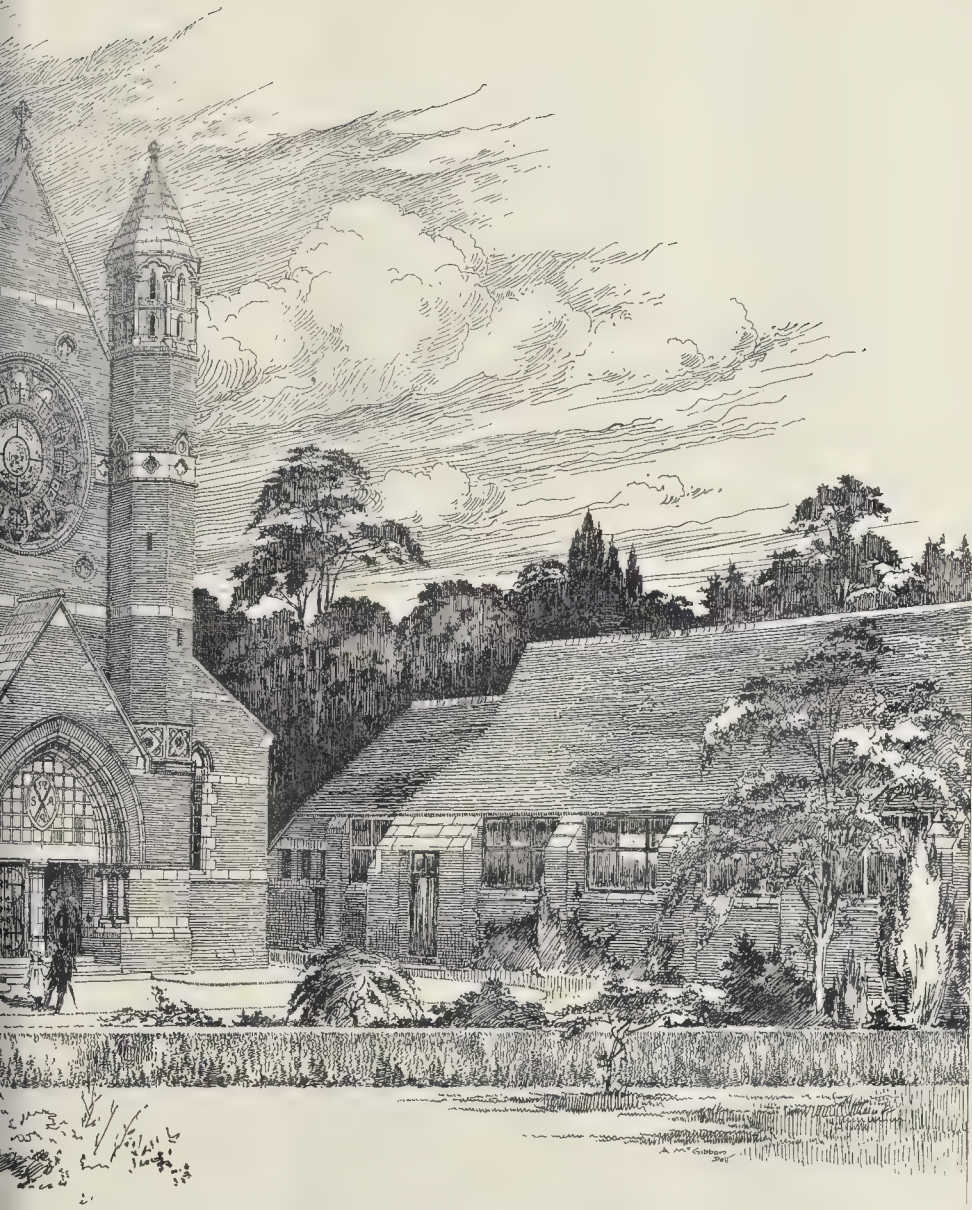
DEVON AND EXETER ARCHITECTURAL SOCIETY.—At the Athenæum, Plymouth, on the 26th ult., a conference of members of this Society was held, the following being present:—Mr. Arnold Thorn, of Barnstaple (President), in the chair; Messrs. E. Appleton, J. Jerman, J. Crocker, G. S. Bridgman, A. Parker, Priestly Shires, H. E. Luff, E. G. Warren, O. J. Ralling, L. Tonar, W. H. Richards, Harbottle-Reed (Hon. Secretary), C. A. King, J. Greenwood, M. A. Bazeley, J. Paton, J. Dwelliey, R. A. Mill, W. F. Bickford, Charles Cole, W. H. Borland,



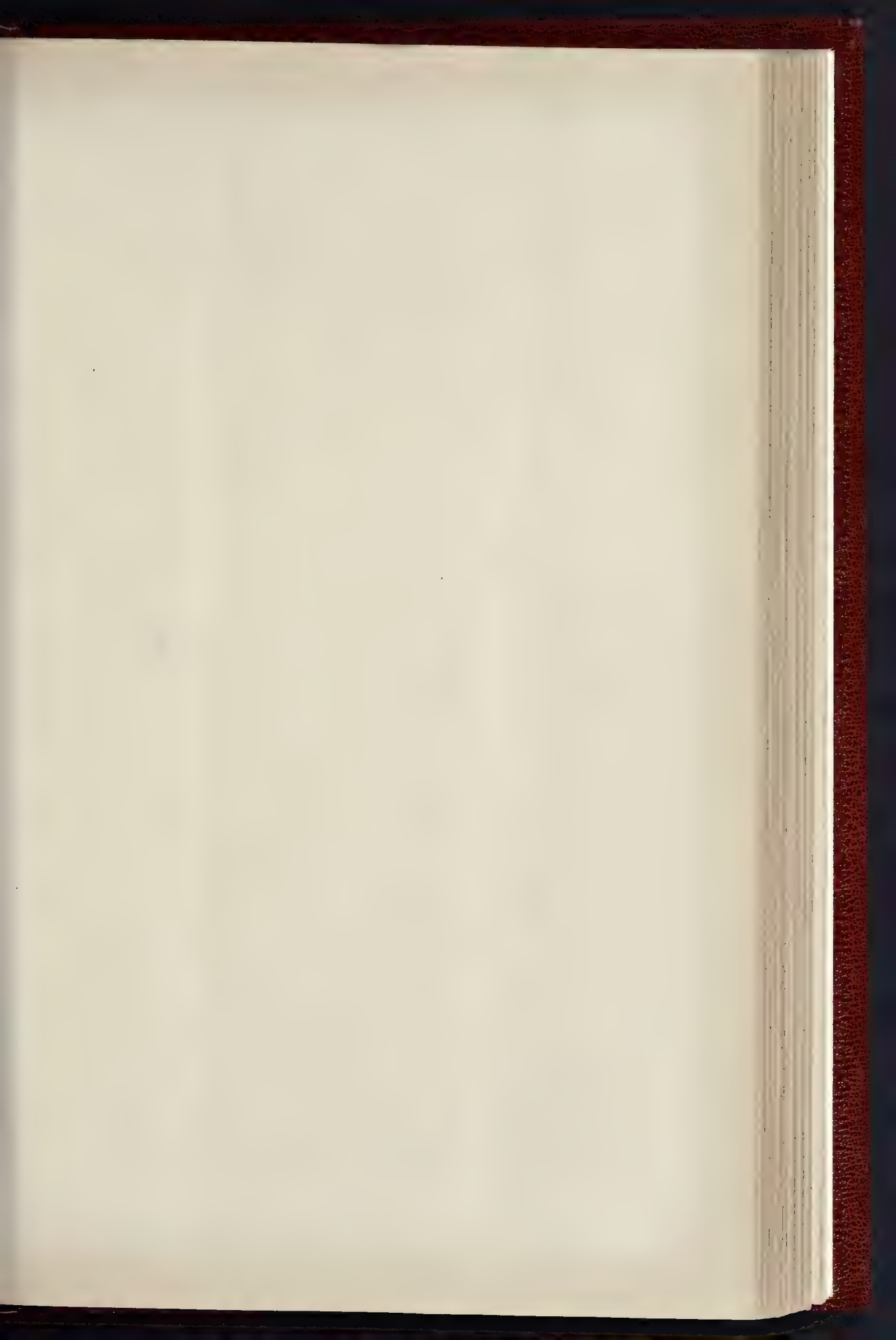
NORTH WEST VIEW S. ANDREW'S : WILLESDEN : JAMES BROOK



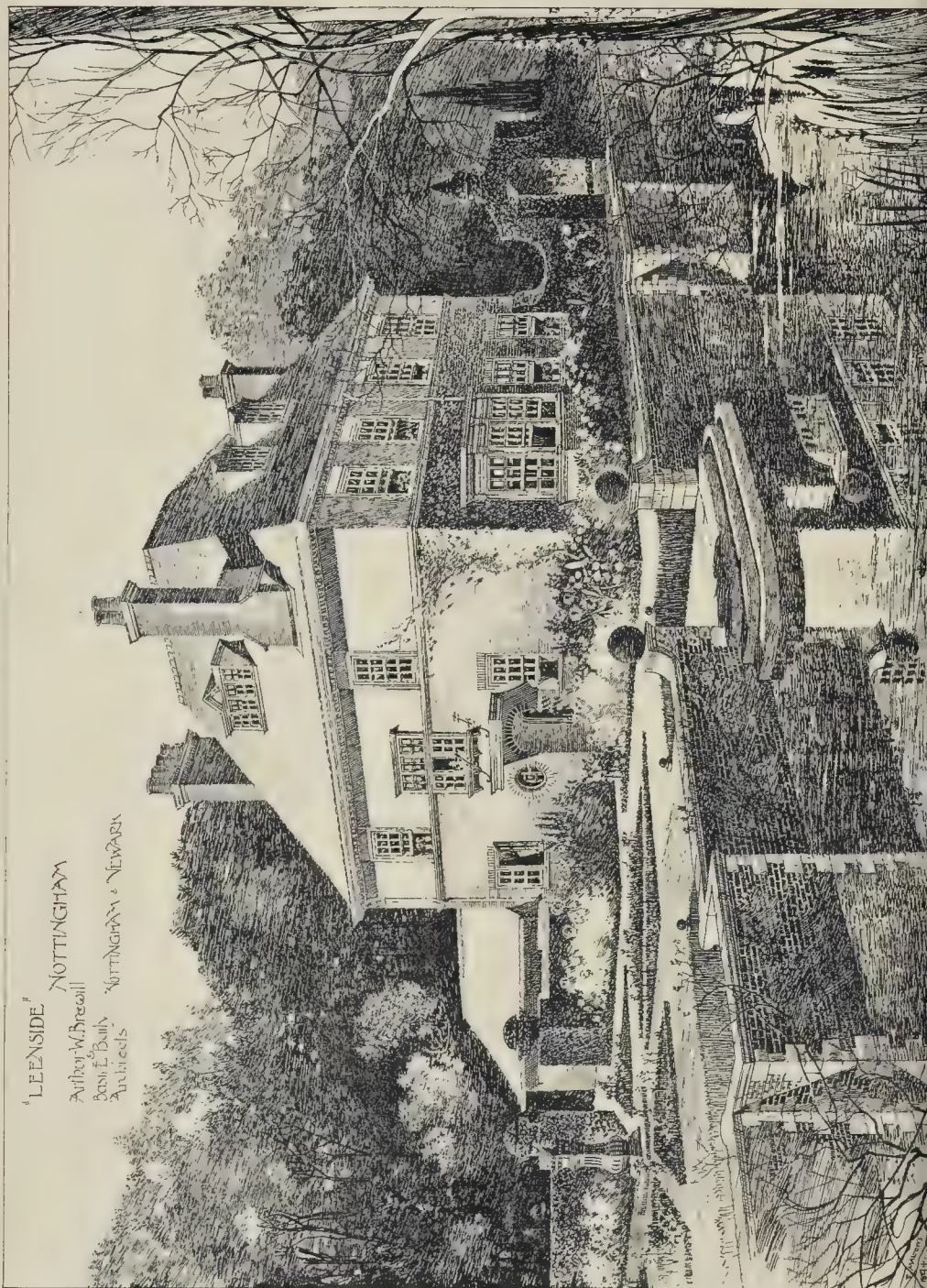
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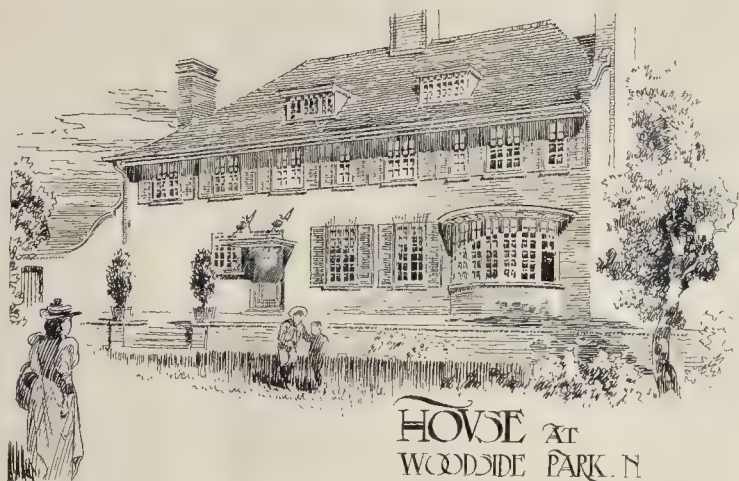


PASTOR L. THOMAS, D.D., 1100 EAST ASHLEY STREET, CHICAGO, ILL. 1895



'LEENSIDE,'
NOTTINGHAM
Author, W. Breckell
Ben. E. Bailey
Architects
'NOTTINGHAM & NEWARK'





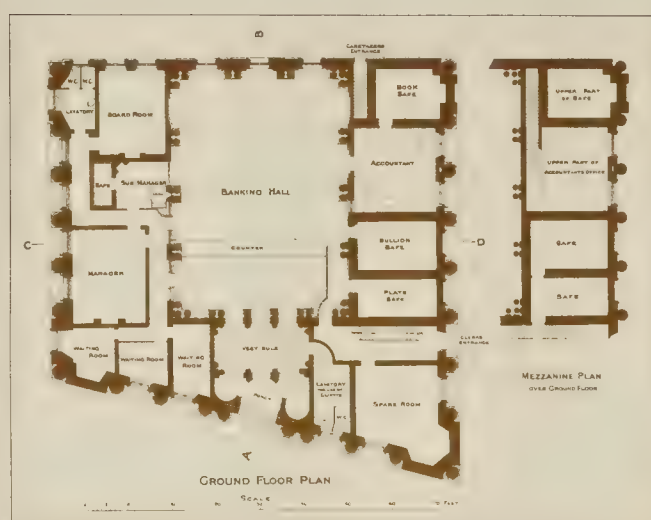
HOUSE AT
WOODSIDE PARK, N.

Mr. William J. Walker, Architect



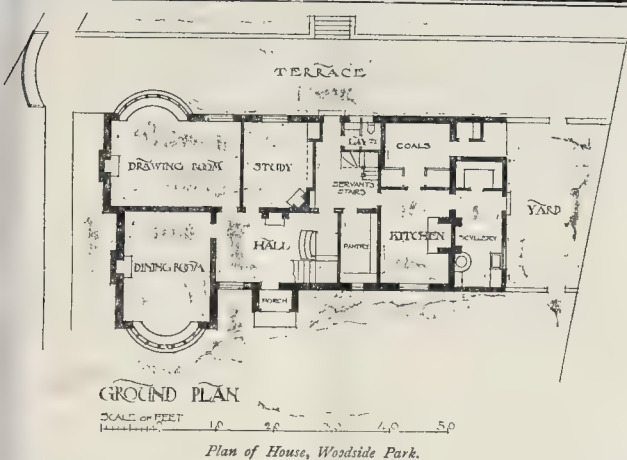
ENTRANCE FRONT







PHOTOGRAPH BY L. E. B. L. EAST, ARN. STREET, NEW YORK.



Mr. Harvey, W. J. Carver, T. R. Kitsall, Perkins, J. A. Bewes, E. M. Leest, Pinder, C. Pinn, A. Norman. The President, in opening proceedings, explained that the object of the meeting was to consider a proposition from Plymouth architects to form a branch of the Society in the Three Towns. A vote was set out in a resolution recently passed at a meeting of the local professional men. In discussion, Mr. Shires pointed out some of social and other advantages accruing from such a body as had been formed in other large towns. Sixteen Societies were now in alliance with the Royal Institute of British Architects, including several in the colonies; and he hoped that along a belt of them would be established around the world, giving enlarged opportunities for interchange of architectural ideas. He suggested the manner in which they should proceed. Mr. Crocker considered that Mr. Shires had fairly put the views of the Exeter members generally. Mr. Appleton was glad that they were anxious for local extension, and, as a member of the Devon and Exeter Society, he would heartily support of Plymouth forming such a branch. Mr. Jernam said they could not expect Plymouth architects to always come to Exeter for meetings, there should be no difficulty in extending the Society in the former place, in which they would have the support of the Exeter members. It was moved by Mr. Shires, seconded by Mr. Luff, unanimously carried, that a local centre of Devon and Exeter Architectural Society be held at Plymouth. Mr. Paton proposed that the committee of architects of the Three Towns be invited to confer with the Council of the Devon and Exeter Society to carry the proposed resolution into effect. This was seconded by Mr. Dwelley, and agreed to. Mr. Crocker, in the name of the Chairman, terminated the proceedings at the Athenaeum. At the conclusion which followed, the loyal toasts were duly honoured. In reply to that of "The Devon and Exeter Architectural Society and its friends," Mr. Thorn referred to the fact that the Society owed its growth (during the speaker's presidency) almost entirely to the efforts of Mr. Warren, who was now retiring from the office of Hon. Secretary; and as it had been conducted by the members that these efforts should be recognised and some acknowledgment made, a description was raised. In handing the result, which took the form of a gold Albert, to Mr. Warren, he desired him to believe that it was a symbol or mark of the feeling in which his services were estimated, and hoped he would accept it as such. Mr. Warren, in thanking the members, assured them that whatever he had done for the Society, he had, in the pleasure of it, amply repaid himself; and, further, his services were greatly due to the members for their support during the past five and a-half years he held office.

DEVON AND EXETER ARCHITECTURAL, ENGINEERING, SURVEYING SOCIETY.—The first ordinary meeting of the session was held on Tuesday last at the Town Hall, when Mr. F. J. Nickols, of the City Surveyor's office, read the annual address. The lecturer treated of the paving, the adoption of which is proceeding at a rapid pace in our large towns, especially since

the introduction of the new woods Karri and Jarrah. After dealing with the different descriptions of wood-paving, the lecturer proceeded to discuss the creosoting of timber, many specimens being shown to the meeting. The paper then dealt with sanitary and sewerage matters, including the use of polarite as a water and sewage filtering material, and concluded with a comparison of the sanitary state of dwelling-houses and streets at the beginning of the present century and now. Mr. Ruthven, in proposing a vote of thanks to Mr. Nickols, referred to the good work Mr. Nickols had done for the Society as Secretary in its early years, and to the prominent part he had played in its inauguration. Mr. Hill, Sanitary Inspector of Carlisle, in the discussion, advocated the use of 5-in. drains for houses as a more suitable size than 4 in. or 6 in.

COMPETITIONS.

SCHOOL, PEMBROKE DOCK, PEMBROKE.—The Governors of the Pembroke Dock County School have selected the designs for the new school at Pembroke Dock submitted by Mr. D. Jenkins, architect, Llandilo, and have awarded the premium of ten guineas to him.

Correspondence.

To the Editor of THE BUILDER.

THE APSE AT RECULVER CHURCH.

SIR,—With regard to Professor Baldwin Brown's observations in the last issue, I should like to add the following remarks, knowing the ruins well, and having collected every print that has been made of the place during the last one hundred years. The apse is clearly all Roman, the workmanship being executed in the neatest manner, and in the straight portions of walls two doors of access were present which had a single jamb for a timber door-case on the inside, all Roman workmanship. These doors continued unblocked and in use from the lengthened side aisles until the Reformation, when the ends of the aisles and these chancel doors were entirely plastered up. The concrete pavement in part existing, from which a writer in the last century was unable to break off a piece with a pickaxe, is identical in the space east of the pillars, as in the nave, but is some inches higher in the apsidal annex. A very careful inspection of Pridden's internal view of the whole church when entire, as well as Hasraud's description, goes to show that the pillars stood upon the base of a rise of steps. The concrete Roman pavement is limited by the side walls of the nave and apse. With regard to the pillars, they were spaced so that the central arch was much wider than those on each side; and in two views taken by different persons in 1809 during the wrecking effected at the instigation of the then vicar; one pillar is seen alone standing, the other disjointed and lying near; the arches above are seen neatly built in Roman tile, and show no signs of falling when the support is taken away; in fact, we know in this part of the edifice gunpowder alone took effect in levelling the walls. In the Church of St. Remi, Rheims, unfinished capitals similar to those formerly in Reculver can be seen built into the north transept; evidently shallow foliage in two ranges was intended.

From these remarks it is evident that the Roman builders need not have hesitated to have, if they had so desired, constructed any width of arch. The late dry weather showed all the foundations of the church to greater advantage than commonly.

"F. G."

"PRE-CONQUEST ARCHITECTURE."

SIR,—Reading Professor Baldwin Brown's interesting papers on "Pre-Conquest Architecture," I notice he speaks of St. Pancras, Canterbury. Can he or some of your readers kindly tell me where it is—is it an old dedication of St. Martin's?

C. W. JEWITT.

SOMERSET HOUSE—A UNIQUE OPPORTUNITY.

SIR,—The sites of several shops at the corner of Wellington-street and the Strand have recently been cleared, and are now to be sold. If the Government could see their way to acquire these sites, and erect thereon an extension of Somerset House in harmony with the present front in Wellington-street, they would confer a great and permanent improvement on London, while economically providing themselves with much-needed further office accommodation. Such an opportunity will not occur again for a century. The neighbouring old houses will doubtless be coming down at no distant date, so that the opportunity will then be afforded of providing Somerset House—one of the chief national buildings—with a noble front in the Strand, extending ultimately from Wellington-street as far as the entrance to King's College. Such an extension could be carried out gradually, as the leases of the old houses fall in; the ground floor could, if thought advisable, be let as shops, and so produce income till such time as the Government found occasion to use them for public purposes. This proposed expenditure, so far from being a waste of public money for merely ornamental purposes, would be one of the most easily-justified from many points of view. It is notorious that further accommodation is required for the Government staff, many of whom are housed in cramped, unhealthy, and more or less temporary quarters; from the nature of the sites in question the whole ground would necessarily be covered with buildings, no space being wasted in open forecourts, &c. And by no means least in consideration would be the great adornment to the Strand—one of the most important streets of the capital—which the proposed extension would create.

F. W. G.

BRICKS, TILES, AND TERRA-COTTA.

SIR,—With reference to your review of "A Practical Treatise on the Manufacture of Bricks, Tiles, and Terra-cotta" in last week's *Builder*, it may interest you to know that a paragraph in the book which you endorse by stating that it is "very well put" occurs in the third volume of "Notes on Building Construction," p. 88. The words are practically the same, and I give them in parallel columns on the other side.

FRANCIS E. L. HARRIS.

. The following are the parallel passages referred to by our correspondent. They certainly bear out what we had already remarked in our article, that the author seemed to have been laying a great many other writers under contribution, without due acknowledgment:—

C. T. Davis' Work.

"A good brick clay is one that contains sufficient fusible elements to bind the mass together, but not so much as to make the bricks adhere to each other or become vitrified. Such clays contain from 20 to 30 per cent. alumina, and from 50 to 60 per cent. silica, the remainder consisting principally of carbonates of lime and magnesia and oxide of iron."

Col. Seddons' Work.

"A good brick earth should contain sufficient flux to fuse its constituents at a furnace-heat, but not so much as to make the bricks run together and become vitrified. Such earths contain from 20 to 30 per cent. alumina, and from 50 to 60 per cent. silica, the remainder consisting of carbonate of lime, carbonate of magnesia, oxide of iron, etc."

BUILDERS' CLERKS' INSTITUTION OF GREAT BRITAIN.

SIR,—I beg to inform you that the meeting of builders' clerks, for the purpose of forming the above Institution, will be held at the Westminster Town Hall, Caxton-street, Westminster, S.W., in Room 13, on Saturday next, November 2, at 5 p.m. All clerks engaged in the trade are earnestly invited to attend, and bring with them any colleagues they know in the trade not at present knowing of this movement.

A postcard, if convenient, to the undersigned, will greatly oblige, from all those whose intention it is of attending the meeting, and also from those unable to attend, but willing to join after the Institution is once started.

I also wish to inform fellow-clerks in the country and London that prospectuses will be issued shortly after the meeting on Saturday.—Yours faithfully,

J. PEARSE BOWDITCH.

94, Dalberg road, Brixton, S.W.

WELLS.

SIR,—In excavating near an old building I lately came on a disused well, a section of which I enclose. The well is sunk in London clay, and although the ground round the well is saturated to a depth of at least 6 ft., the water in the well stood at a level of 41 ft. below the surface, or 20 ft. below the level from which the pumps still existing could have drawn water.



Section of Well referred to in Mr. Cooper's letter. (The dotted line A-A represents level to which underground water rises.)

It seems impossible that the water in the well could have evaporated, as the stone covering the well had about a foot of garden mould in a sheltered position over it, and surrounded with ground, as before stated, which was saturated.

C. H. COOPER.

Wimbledon Urban District Council.

A MAGNIFICENT OFFER.

SIR,—At a recent meeting of the Northallerton Urban District Council a resolution was carried that invitations be sent to three or four "competent engineers" asking them to formulate a sewerage scheme suitable for that district, and that the Council should offer a premium of £50 for the scheme which they decided to accept. Surely the District Council made a serious mistake when they resolved to offer the magnificent sum of £50, as a premium, and Mr. Baines forgot himself when he indulged in such an outburst of generosity towards three or four "competent" engineers when he moved that they should be asked to formulate schemes of sewerage for an important place like Northallerton, and that the successful engineer should be paid the sum of £50, which is about equal to a penny per head of the population, and about one-third of a penny in the pound on the general district rate of the district. Any "competent" engineer who complies with an invitation of the Northallerton Council which expects something for nothing is not worth his salt, and ought to (as he would, no doubt) earn the contempt of the engineering profession. I have yet to learn that a man's services are to be rewarded according to the measure of the poverty of the local

authority requiring his services. If I thought that such bounty as that proffered by the Northallerton Urban District Council were to be my reward, I would ask my father to cancel my articles with the "competent" engineer under whom I am serving, and either to hire me out as a crossing-sweeper or to put me as an apprentice to a hawker of sand and rubbing-stones, so that I might have the hope of some day securing a competency, and of eventually retiring to a suburban villa and becoming a famous District Councillor, moved only by one feeling—that of saving the rates and paying every man according to his worth—his worth being assessed by me.

"APPRENTICE," C.E.

October 23, 1895.

PEMBROKE DOCK INTERMEDIATE SCHOOL COMPETITION.

SIR,—Probably it will be of interest to certain of your readers to know how (as I am given to understand) the above competition is being managed; for I find competitors cannot learn much by inquiry of the clerk.

I have written to know what result has been arrived at, but no answer has been sent. From another source I gather that about a month ago a Mr. — was sent for by the Governors to receive their instructions as to how he should modify his plans, and also reduce the cost to meet their views, as his competition design far and away exceeded the stipulated amount, and that until it was seen how the amended set turns out, nothing would be settled.

I need not ask whether it is fair for this architect to have the opportunity of amending his plans, while the decision is held in abeyance.

"A COMPETITOR."

ST. SAVIOUR'S GRAMMAR SCHOOL.

SIR,—My attention has been called to a paragraph in your issue of the 26th ult., stating that it is the intention of the Governors of the St. Saviour's Grammar School to remove to some convenient spot in the London suburbs. I beg to inform you that up to the present time the Governors have not come to any such conclusion.

HENRY LANGTON,

St. Saviour's Vestry Office.

Clerk

The Student's Column.

METALS USED IN BUILDING.—XVIII.

COPPER ALLOYS (continued).

Oriental Bronze.

THE majority of the celebrated art objects from China and Japan, usually known as bronze, are not in reality entitled to that name, though they may be conveniently alluded to now as being at any rate alloys in which copper enters to a very large extent. The Chinese and Japanese have attained great perfection in the manufacture of these alloys, many of which contain large proportions of gold, though this precious metal is not employed to any extent in bronzes for interior house-decoration. The Chinese make bronze ornamental work forged by the hammer, which is very thin and raised up in the middle. Klapproth has shown that these contain nothing but copper and tin, in the proportion of 78 of the former metal to 22 of the latter. This alloy when newly cast is as brittle as glass; but by being plunged at a cherry-red heat into cold water and confined between pieces of iron to keep the casting in shape, it becomes tough and malleable.

The following alloys are typical of the metal used in Japan and China for colossal statues and any large high-class decoration work:—

Chinese and Japanese Bronzes.

	I.	II.	III.	IV.
Copper	94.61	95.77	67.31	51.05
Silver	1.15	.08	32.17	48.81
Gold	3.73	4.15	174.68	.12
Lead .....	.11	—	.52	—
Iron	—	—	—	—

Alloys Nos. I. and II. are known as *shakudo*, and are principally characterised by the large percentage of gold; for all practical purposes they may be regarded as modified forms of copper. The gold, however, serves a useful purpose, as the alloy is enabled in consequence to receive a purple patina by the application of pickling solutions. This subject has formed an exhaustive study on the part of Professor Roberts-Austen, who has done so much to increase our knowledge of Oriental bronze. Concerning these pickling solutions, the student may consult the *Journal of the Society of Arts*, October, 1888.

Alloys III. and IV. in the above table are known as *shibuichi*, of which, however, there

are many other recognised standard varieties. The percentage of silver, it will be noted, is very high; the alteration of this ingredient in the air imparts a rich tone to the metal as used for decorative purposes. Professor Austen observes that copper containing a small quantity of antimony gives a very different shade to that resulting from the pickling of pure copper. But the copper produced in Japan is often the result of smelting complex ores; the result is that the so-called antimony of Japanese art metal-workers which is present in the variety of copper known as *kurumi* is an alloy of tin, cobalt, &c., with copper. Oriental metallurgists often blend metals and alloys of different colours by pouring them together at a temperature near the solidifying point of the more infusible of the metals to be associated, mottled alloy being thus produced.

Other Oriental bronzes contain from 2 to 6 per cent. of tin with lead up to 20 per cent., and a fair proportion of zinc, weathering to a deep black tint. It does not appear, however, from the researches of French metal-workers that lead must necessarily be present to lead to the deep black assumed.

Manganese Bronze.—Ferro-manganese has been employed with copper, and for certain purposes this enables inferior grades of the cupriferrous metal to be alloyed with zinc, &c. The general effect of manganese is to render the copper tougher and more ductile, and when iron is present to a small extent the tenacity and elasticity of the copper are increased. Such alloys are not easily corroded, but, being used more especially in machinery for ships, are not very important to us.

Bell-metal.—Ordinary bell-metal is an alloy of copper and tin, but in certain cases other metals are added to produce definite tones or to cheaper production. In any case, however, the proportion of other metals is small, except in bells for domestic use, in which a large quantity of antimony (up to 13 per cent.) or bismuth (nearly 4 per cent.) is commonly employed. Quite a large number of cheap bells are only brass, more particularly when raised work has to be produced exteriorly. Large bells are cast with an alloy of 4 parts copper to 1 part tin, which also closely resembles the material used for cymbals and gongs. The metal when first cast is very brittle, but becomes some what malleable after being heated to redness and quenched in water. To impart elasticity, which is necessary in order that it may emit a full, clear sound, the bell is again heated and allowed to cool slowly. Apart from inherent qualities of the metal used, the tone of a bell is materially influenced by its size, shape, and thickness.

Gun-metal.—We are not interested in this metal as applied to the manufacture of ordnance (purpose, however, for which it has been almost entirely superseded by iron and steel); its sole use for us is in making "anti-friction" bearings for machinery and the like. Gun-metal as understood in the market is an extremely variable substance, composed essentially of copper, but should possess the requisite degree of hardness and toughness; a good gun-metal is obtained by mixing copper, tin, and zinc. On the whole, this alloy is more fusible than copper, and presents great resistance to strain tending to force its particles asunder. Professor A. R. Huntington remarks "that in consequence of the great difference in the specific gravity of the metals employed it would scarcely be possible to mix them thoroughly if they were simply introduced together into the reverberatory furnace in which the alloy is prepared. It is customary, therefore, to melt the tin first with twice its weight of copper, so as to obtain hard metal which is then added to the proper proportion of copper melted on the hearth of the reverberatory furnace, care being taken to exclude oxygen as far as possible. The formation of the alloy is facilitated by the addition of old gun-metal, a little more than the necessary proportion of tin is usually added in order to allow for the unavoidable conversion of a portion of the metal into oxide by the oxygen of the air."

TIN ALLOYS.

Pewter.—We should be very sorry to attempt an exact definition of the metals that, generically, go by the name of pewter in the market. On the whole, they may be said to be alloys of tin and lead, with a little antimony or copper, depending on the particular purpose for which the metal is required. For many years English pewterers have distinguished three principal kinds called

* "Mixed Metals." 1890, p. 253.

and has caretaker's room, baptistry, &c. The ark is of pitch-pine. There is also a platform, or reading-desk, in Gothic style, occupying the centre of the synagogue. It has three or four entrances, and above it is a damask canopy. The contractor was Mr. James Snelling, Pontypriid, and the architect Mr. Lloyd.

ADDITION, EXETER HOSPITAL.—An extensive addition, costing upwards of 7,000*l.*, is being made to the Devon and Exeter Hospital, from the designs and under the superintendence of Mr. Cole, of Exeter. The contract has been let to Messrs. Tree & Bailey. The floors are to be fireproof, on the "Mark Fawcett" system.

BURGH CHAMBERS, MILLPORT, BUTE.—These new buildings were recently opened by Provost Allan. The buildings, attached to the Town Hall, consist of a lesser hall, kitchen, smoking-room, committee-rooms, ladies' and gentlemen's cloak-rooms, lavatories, and Commissioners' chambers, to be reserved exclusively for Council meetings. The architect was Mr. Barclay.

RESTORATION OF ST. ANDREW'S CHURCH, NORMANBY, YORKSHIRE.—The Archbishop of York, on the 26th ult., reopened the ancient church of St. Andrew, Normanby, near Kirbymoorside, restored under the supervision of Mr. Temple Moore, architect, of London. The church had suffered much from the ravages of time, and prior to the restoration presented a somewhat dilapidated appearance. The north aisle had gone, the arcade being filled up. Most of the windows had been modernised. The chancel had been considerably shortened, presumably in the last century. Included in the present restoration were the rebuilding of the north wall, restoring the north aisle, and opening out the thirteen-century arcade. The chancel roof was rebuilt, and a new east window inserted, the work of Mr. Victor Milner, of London. It is of three lights. A new west window, of three lights, has also been inserted, given by the Earl of Feversham. Other work includes the rebuilding of the south door, refacing of west wall, rebuilding of bell-tower, and the bells recast by Messrs. Mellamy, of Masham. The roof of the church is entirely new. The nave is covered with modern tiles, but the old stone slabs were used for the chancel-roof, the ceiling of which is divided into panels, &c. The old box-pews have been dispensed with, and open seats of pitch-pine substituted. The chancel-seats, reading-desk, and pulpit are of oak. The remains of a Norman piscina, which were found in rebuilding the chancel-arch, have been built into the south wall of the chancel. Several old fragments of tombs, on which appear the cross of St. Cuthbert, have also been built into the walls and flooring. A new stone font, given by the Misses Hill, takes the place of a quaint wooden one, which has been placed near the south door, and "converted into an alms-box."

BOARD SCHOOLS, SALFORD.—On the 26th ult. the memorial stones were laid of two new schools—one in Blackfriars-street and one in Marlborough-road, Salford. The site of the building in Blackfriars-street contains 3,015 square yards. The school will accommodate 666 children, 200 being infants and 376 older children. The school is being built by Messrs. W. Southern & Sons, from designs prepared by Mr. Henry Lord. The tender for the building amounted to 7,268*l.* The school is arranged transversely to the length of the site, and stretches from East Stanley-street to Wheatthill-street, with its main frontage to Blackfriars-street. The Marlborough-road school will accommodate 626 children—namely, 450 girls and 176 infants. The school is the first which the Board has built on the central hall system. Each of the two departments will have a central hall 60 ft. by 30 ft., and class-rooms will be ranged on three sides of the central hall. The site contains about 5,300 square yards (measuring into half the adjoining streets). The building is being erected by Messrs. R. Neill & Sons, from the designs of the architects, Messrs. Woodhouse & Willoughby. The accepted tender amounted to 7,777*l.*

CONSERVATIVE CLUB, NEW SEAHAM, DURHAM.—On the 26th ult., a new Conservative Club was opened at New Seaham. The new institution faces the main road, and is built of brick, with stone-facings. On the right of the entrance is the billiard-room. On the opposite side of the entrance are two apartments—the reading-room and smoke-room, respectively, which can be thrown into one. There are also a committee-room, bar, caretaker's-rooms, and other apartments. The building has been erected from the designs of Mr. Robert Currie, New Seaham.

CO-OPERATIVE PREMISES, NEWCASTLE.—The new premises which have been erected by the Newcastle Branch of the Co-operative Printing Society, Limited, at the corner of Rutherford-street and Bath-lane, have just been opened by Mr. John Shotton. The building has been erected from designs prepared by Mr. F. Rich, architect, of Newcastle. It occupies a site containing 800 square yards, nearly the whole of which is occupied by buildings. The building is six stories high, and is constructed with brick, with stone dressings. The building is lined throughout with cream-coloured glazed bricks. The floors of the building are constructed of cement, concrete, and steel girders, and finished with wooden blocks. The various rooms and shops throughout are warmed by a system of low-pressure hot-water

pipings. Ample cellars and paper stores are provided in the basement, where also the engine driving the whole of the machinery stands. On the ground floor the sale shop is situated, together with a large paper store. The entrance to the workshops is by a separate staircase. The timekeeping office is contrived at the foot of the staircase leading to the workshops. The cart entrance and loading dock are planned in connexion with the paper store. The first floor is occupied by the printers, who have a shop 48 ft. by 46 ft., and here also are the board-room and offices, each having a separate entrance. The second floor forms a bookbinding shop 64 ft. by 48 ft., and the third floor a composing shop 64 ft. by 48 ft. A lift connects the whole of these floors from the basement to the third floor. A paper-shoot is also contrived. A dining-room about 24 ft. square, is situated over part of the compositors' shop, and shows on the exterior, at the corner of the site, a dome, which rises to the height of about 100 ft. above the pavement. The building is lighted throughout with electricity. The contractors for the building were:—Masonry and joiner work, Messrs. J. & W. Lowry; slating, Messrs. Hewitson; plumbing and heating, Messrs. Walker & Son; cement flooring, Messrs. W. B. Wilkinson & Co.; painting, Mr. G. G. Laidler; electric lighting, Messrs. W. H. Holmes & Co., all of Newcastle.

"THE KNAPP," BRADPOLE, DORSET.—The work in connexion with the erection of this residence, which crowns the hill near the church, and occupies the site of the old "Knapp Inn," has just been completed. Mr. Johnson, of London, was the architect; Messrs. T. Stone and R. B. Williams being the contractors. Mr. Harry Hems, of Exeter, carved one of the oak mantel-pieces at "The Knapp."

WELSH PRESBYTERIAN CHAPEL, LIVERPOOL.—The Welsh Presbyterian Chapel, Prince's-road, Liverpool, is now ready for reopening. The interior of the chapel and organ-case and pipes have been cleaned and decorated. Pitch-pine ornamental glazed vestibules and screens have been constructed at entrances of the chapel, and the chapel and vestries are lighted by electric-light, supplied and fitted by the Electric Supply Company, of Liverpool. In addition, the mission-hall and library have been enlarged and carried one story higher, provision being made for two class-rooms, with lavatories, cloak-rooms, stores, and offices. A minister's vestry with outer walls faced with Yorkshire stone shingles and Stourton stone dressings, has been built. The lecture-halls and schoolrooms have been ventilated by Messrs. Whitehead, ventilating engineers, Liverpool. The total cost is nearly 2,000*l.* Mr. John Evans, Liverpool, executed the screens; Messrs. Jelly & Co., Liverpool, were the decorators; Messrs. Haugh & Pilling, Liverpool, were the contractors. The whole of the work has been carried out from plans and specification prepared by and under the supervision of Mr. T. G. Williams, architect, Liverpool.

CHOIR VESTRY, IDLE CHURCH, YORKSHIRE.—The memorial-stones have just been laid of the new choir vestry for the Idle Parish Church. The architects for the new vestry are Messrs. Kendall & Bakes, and the contractor is Mr. Coates Murgatroyd, of Leeds.

MASONIC HALLS, GLASGOW.—On the 26th ult. the foundation-stone of the Glasgow Masonic Halls was laid by the Provincial Grand Master. The building is situated at 98 and 100, West Regent-street. The part fronting the street will be five stories in height, and will be let for commercial purposes. At the rear will be a large Masonic Hall measuring 65 ft. by 40 ft., and capable of seating about 450 persons. Adjoining will be two lodges-rooms, with the necessary accessories, for the meetings of lodges. The buildings will cost about 16,000*l.* Mr. J. L. Cowan, I.A., is the architect.

RENOVATION OF ST. JOHN'S, REDLAND, BRISTOL.—This church has just been re-opened, after having been closed since July for the carrying out of a scheme of renovation and repair. A new pulpit has been added as a gift of one of the members of the congregation. This is constructed of Caen stone, the panels being divided by Devonshire marble. Alterations have also been made to the choir-stalls, the roof repaired, and the bell rehung. A new reredos is now in course of construction. The pulpit is from a design by Mr. H. V. Gough, the architect, who has also undertaken the general supervision of the renovations.

HIGHER GRADE SCHOOL, GRIMSBY.—The Winttingham Higher Grade School, at Grimsby, which has just been built and furnished at a cost of 11,808*l.*, was opened on the 25th ult. The school is situated in Eleanor-street, and has been freely treated in the Flemish Renaissance style. The roof is of granite, and the main roof is surmounted by a turret. Accommodation is provided for a thousand pupils, and in addition to the various class-rooms, lecture-theatre, &c., there is a swimming-bath and gymnasium, a manual instruction-room for iron and brass work, fitted up with lathes worked by power, and a chemical laboratory. A dining-room is also provided for the use of pupils coming from a distance. For the girls, there is a large laundry and ironing-room, with drying-closets and other accessories. The work has been carried out from the designs and under the superintendence of Mr. H. C. Scapling, the Board's architect. Messrs. Hewins &

Goodhand, of Grimsby, were the contractors for the building. The heating apparatus is by Messrs. King & Co., of Hull; bath-heating arrangements and piping, Messrs. G. N. Haden & Son, of Manchester; and plumbing, Mr. J. D. Grimby, of Grimsby. **RESTORATION OF THE PARISH CHURCH, LLANTHONY.**—The Parish Church of Llanthony has been under restoration since 1893. It consists of nave, 52 ft. by 19 ft.; chancel, 34 ft. by 15 ft., and north porch. It is situated 779 ft. above sea level of the sea, six miles from Llanvihangel Crucorney Station, Great Western Railway. The nave roof consists of eight pairs of principal rafters carrying two purlins on each side, supporting fifty-six common rafters and double ridge pieces. This roof has been stripped, the timbers thoroughly restored, then strengthened with iron plates, straps, and bolts, and covered with boarding, felt, and the old stone tiles relaid. The floor of the nave has been lowered so as to get a step at the chancel arch, but it is still 18 in. above the original floor line which was found, but could not be kept. A bed of concrete has been laid over the whole area of the nave, of what was originally the Abbey infirmary. The modern seats, pulpit, and ancient font have been re-fixed. The internal plaster has been retained, it is quite in keeping with the style of the interior. The porch has been inserted in the north wall to give light to the pulpit. All the windows have been re-glazed by Messrs. Joseph Bell & Sons, Bristol. A new oak door for the north entrance has been provided. The hinges, hooks, latch, ring handle, and straps are the work of Mr. James Howells, the village smith. The church is heated by one of Musgrave's latest improved underground systems. The porch has been rebuilt with the exception of the east wall. The timber used in the restoration was supplied by Messrs. Alexander & Co., Cardiff, and Messrs. Batchelor & Co., Newport. The first portion of the work was finished by Mr. Pritchard, of Llanthony. The second contract was completed by Messrs. Denman & Sier, Aberystwyth. During the excavation of nave and porch floors several pieces of pottery and glass were found, most of them about three hundred years old. The work has been carried out from the plans and under the superintendence of Mr. J. James Spencer, architect, Aberystwyth.

NEW CATHOLIC CHURCH, CHELSEA.—On the 26th ult. the opening of the Church of Our Most Holy Redeemer, Cheyne-row, Chelsea, took place. The church, which was designed by Mr. Edward Goldie, is Italian in style, of an English type. It is 115 ft. long by 34 ft. in width across the nave, and has a height of 42 ft. An illustration of the building appeared in our issue of the 12th ult.

SANITARY AND ENGINEERING NEWS.

THE POLLUTION OF THE AIRE AND CALDER.—On the 20th ult. the Elland Urban District Council instructed Mr. Malcolm Paterson, M.Inst.C.E., Bradford, to prepare detailed plans, specifications, and quantities of the works for the main outfall works and sewage treatment of the district, recommended by the Local Government Board. The circumstances connected with this sanction a worthy of note as bearing upon the powers of districts, and the pollution of rivers. The scheme embraces the reception of trade-refuse into the sewers. The volume of this, in proportion to the domestic sewage, is very large, and the Local Government Board recommended the reconsideration of this part of the scheme. For eighteen months the Council held back their sanction on this ground only, no alteration whatever being suggested in the works proposed. The Council, however, did not move from what they deemed the fair policy to the manufacturers, considering that the responsibility for this refuse, accepted as it was by the other measure imposed upon them by the Rivers Pollution Act of 1876, belonged to them, and should not be refused. To do so, they thought, would be to handicap their own largest ratepayers—who would have to make and maintain the works—in favour of their rivals. A further complication existed in the fact that, for a generation or more, trade refuse of the same character—woollen drying and scouring—has been largely received into the sewers of Elland, and in the knowledge that capital has been largely invested on the security of the relief thus afforded. The assent of the Local Government Board was accompanied by a statement that the Council, and not they, must take the responsibility of securing that no breach of the Rivers Pollution Act shall occur. The amount of the loan sanctioned was 13,800*l.*

WAKEFIELD WATER AND SEWERAGE WORKS.—A meeting of the Wakefield City Council was held on the 22nd ult., when a recommendation from the Waterworks Committee was discussed, that a duplicate length of mains should be laid from Ardsley to Wakefield, 18 in. in size, from Ardsley to Little Hill, and 24 in. between Little Hill and the city. The New Scarborough; and also that the engineers should be given to Mr. H. Rofe, of Wakefield, to proceed with the preparation of plans, specifications, and estimates, for the construction of the Booth, Dean, and Oxygrains reservoirs. The Council also considered a recommendation from the

* The archaeologists of the Department du Nord, we fear, have been premature in their rejoicing. It is but too likely that the Department of Fine Arts will destroy the gateway as effectually by their "restoration," as it could be done by demolition.

A highly-interesting collection of modern paintings has been opened at Gurlitt's exhibition rooms at Berlin. There are several works by Lembach, Menzl, and Leibl. The Richard Wagner Museum has now been given a new home at Eisenach. A very important Act has been published in the official *Gazette* which will greatly influence the housing of the workmen and minor officials in the employ of the Government. The sum of 250,000*l.* is put at the disposal of the authorities for the erection of sanitary artisans' dwellings, which will be let at a moderate rental. It is expected that the rents will cover the annual expenditure for upholding the new property and its administration, and perhaps even leave a surplus after a moderate interest has been paid on the capital. The surplus, if any, will be used to form a benefit fund for the tenants. The competition for the monument to the deceased painter Richter at Dresden has been decided in favour of Herr Kirchhausen, of Brunswick (premium, 100*l.*, and the commission). There were thirty-three designs. Extensive alterations and some additions will be taken in hand at the old Government hospital, known as the "Charité." A special exhibition of technical books and journals has been held at Munich. Our two official architectural contemporaries, *Zeitschrift fuer Bauwesen* and *Centralblatt der Bauverwaltung*, received distinctions.

AUSTRIA.—Some extensive school buildings have been opened at Vienna for the military cadets. The blocks have cost over 100,000*l.*, and include a fine riding-school with stabling for sixty-five horses. An exhibition of work from the Arts and Crafts Schools has been opened at the Austrian Museum at Vienna. Several new schemes for supplying Vienna with drinking-water have been put before the Municipal Authorities, but no decision has yet been arrived at. The new Tuerkenschanz Tunnel, which is one of the principal works in connection with the new metropolitan railway at Vienna, has now been cut. Its length is about 850 yards. A large iron church has been completed at Vienna for the Bulgarian Colony at Constantinople. M. Aznarour, of Constantinople, is the architect, Professor Neumann, of Vienna, acted as consulting engineer, and Herr Hallitschek, of Vienna, acted as consulting architect. An extensive hospital for consumption is to be erected at Alland. The first block, with 108 beds, which will cost about 20,000*l.*, has been commenced. The buildings for the "Millennium" Exhibition at Budapest are being run up with great rapidity, and the works on the new underground railway are also making progress. The exhibition grounds practically comprise the whole of the City Park, and there will be altogether over one hundred buildings on the ground. The principal blocks are destined for the historical collections, and show respectively the Romanesque, Gothic, and Renaissance styles. M. Alpar is the architect. Linz is to have electric tramways. This will be a great convenience for tourists descending the Danube by steamer, as the railway station is a considerable distance from the river. At Bruenn an interesting exhibition of tombstones has been opened. The exhibits are partly in form of designs and models, but there are also a number of full-size monuments. The new theatre at Agram, which has been opened by the Emperor of Austria, holds an audience of 1,100. Messrs. Felner & Hellmer, of Vienna, are the architects, and have been much complimented by the Emperor for the successful designs of this building and several others in the Austrian provincial towns. The proprietors of the great Vienna brickfields propose erecting sanitary dwellings for their workmen. This means housing 8,000 souls. The Imperial Lunatic Asylum at Vienna is to be closed, and some extensive blocks will be erected on modern principles in the country. At Laibach, where a new theatre of some architectural pretension has lately been opened, some extensive hospital buildings have also recently been completed.

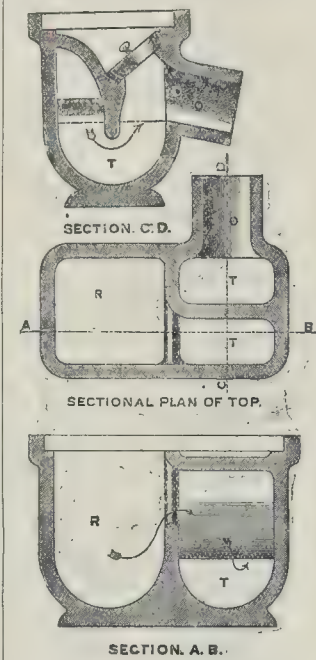
MISCELLANEOUS.

FORM OF CONTRACT FOR NEW BOARD SCHOOLS IN LONDON.—At the meeting of the London School Board on Thursday last week, the Works Committee submitted the report, which we printed in our issue of the 19th ult., p. 282, proposing certain alterations in the terms of all new contracts. Mr. Gautrey moved an amendment to refer the report back to the committee. He wished the report to go back, in order that the representatives of the workmen might be consulted. The Rev. J. Carlile seconded the amendment. Mr. Huggett consented to take the report back.

SWISS EXHIBITION AT GENEVA.—A great National Swiss Exhibition will be opened in the ancient city of Geneva on May 1 next. Extensive works are now in progress on the Plain Palais; huge blocks of buildings are being erected in the suburbs of the city to provide accommodation for the many tourists who will flock to the centre of "the playground of Europe." Artisans and others are advised not to seek employment there, as the labour market is well supplied. Students and landed proprietors will find much to interest them in the numerous examples of Swiss architecture, which are to form special features of the exhibition.

"MUSEUM SUNDAY."—To-morrow, November 3, there will be various special exhibitions, &c., open under the auspices of the Sunday Society, for those who apply for tickets to the Secretaries of the Society, Mr. Mark H. Judge (Hon. Secretary) or Mr. Herbert Freeman (Assistant Secretary), at 26, Regent-street. The following are the places which the owners or managers have agreed to open to holders of Sunday Society tickets:—The Dulwich Gallery (2 to 4); the Flaxman Gallery, University College (2 to 4); the Botanic Gardens, Regent's Park (2 to 5); the Grafton Gallery (3 to 5); Apsley House (3 to 5); the Lady Brassey Museum (3 to 5); Sir E. Burne-Jones's Studio, Lisgar-terrace, West Kensington (3 to 5); Mr. G. F. Watts's Studio, Melbury-road, West Kensington (3 to 5); Mr. Holman Hunt's Studio, Draycott Lodge, Fulham (3 to 5); and the Institute of Oil Colours Exhibition, Piccadilly Galleries (7 to 10). These are open for this occasion by special arrangement, in addition to the considerable list of Municipal Institutions, Libraries, &c., which are open during a part of Sunday afternoon or evening. Sermons are to be preached in a good many London churches in favour of the movement.

THE "GROSVENOR" PATENT GULLY.—The illustrations show the plan and two sections of this gully, designed by Messrs. Bowes-Scott & Western, for receiving surface water, lavatory and bath wastes, yard and stable drainage, &c., from large institutions, such as barracks, factories, hospitals, &c. It consists of a large receiver so arranged as to enable it to be cleaned out without unsealing or in any way affecting the trap; and the trap, as will be seen, is permanently sheltered, and therefore not so



The "Grosvenor" Patent Gully.

readily evaporated should the supply of water to gully fail. A cleaning eye is provided on the outlet which allows of drain rods being inserted, so that any obstruction between gully and drain can be cleared away, should such occur. The gully appears to be a very good and effective one. When the end marked A on the plan is required to be fixed against a building, the outlet may be either right or left-handed. The one shown is a left-hand gully.

MEMORIAL CROSS, EAST BRENT, SOMERSETSHIRE.—The base of the memorial cross in East Brent Churchyard has just been completed. The steps which form the base have been raised about 6 in., and the foundation of the same was found to be so firm and secure that the architect and contractor deemed it unnecessary to build a new one. On the 15th ult. the wooden model of the cross was placed in position by Mr. Hems, of Exeter, the sculptor, for the approval of the committee. The committee who were present expressed themselves satisfied with the design, and the work is now in hand.

MEMORIAL BUST, BUXTON, DERBYSHIRE.—By way of perpetuating the memory of the late Duke of Devonshire, it was some months ago decided that a bust should be placed in the Pump-room. From among a number of competitors Mr. Keyworth, of London, was selected to execute the

work, which has been done in Sicilian marble. The bust rests on a marble bracket on the north side of the new Pump-room.

AN ANCIENT ROMAN GALLERY.—According to the *Pall Mall Gazette*, efforts are being made at Albano, near Rome, for recovering the remains of the pleasure-gallery of Tiberius, which is sunk in the waters of Lake Nemi, and from which, it is stated, a number of bronze articles of different kind have already been recovered.

MEMORIAL BUST, MONTROSE.—A bust to the memory of Dr. Robert Brown, the botanist, unveiled at Montrose recently. The bust is in bronze, the work of Mr. D. W. Stevenson, R.S.A. It is placed in a niche in the front of the house in the High-street, Montrose, where the botanist was born. The edifice will probably be removed ere long, to make way for a new Town Hall, and in the event a permanent niche will be provided for the bust in the facade of that edifice.

ELECTRIC LIGHTING, NEWPORT.—The public inauguration of an electric light supply has recently taken place at Newport, Mon. The consulting engineer has been Mr. R. Hammond, who was assisted by the Borough Engineer, Mr. K. H. Haynes, in superintending the work.

CHANGE OF ADDRESS.—The Stanton Ironworks Company have given up their London office at Palace Chambers, Westminster (Mr. F. Davis, who was long their agent at that address, having retired), and have appointed Messrs. Bock & Co., 130, Great Suffolk-street, Southwark, as their agents for London and the south and west of England.

CLASSES IN PHOTOGRAPHY, PHOTO-PROCESSING, &c.—At the Polytechnic Institute, Regent-street, a series of lectures have been organised, to open on Monday next, on the practical photography and photo-process work, lithography, &c. The subjects seem to have been fully considered, there is a large programme of instruction, and a number of lecturers and teachers engaged.

PRINTED GLASS TABLETS.—Messrs. Newell & Co. (London) send us specimens of a new method of executing printed inscriptions on white enamel glass, which is both cheap and practically indestructible, except by actual breakage; the printed letters appear to be quite permanent, and cannot be scraped off or defaced.

GAS EXPLOSION IN THE STRAND.—An explosion of gas occurred on Tuesday evening in New Church-court, a passage leading from the Strand into Clare-market. About seven o'clock a terrific report was heard, and one of the houses in the court No. 27, consisting of several stories, collapsed, carrying with it portions of the walls and roofs of the adjoining houses. The first explosion did not at first completely demolish one of the houses, for although the lower part came down as far as the first floor, the upper stories were left in position supported by some beams. When the Brigadier arrived six firemen, including Fireman Sells and Fireman Spragg, were specially told off to search the ruins. They saw two bodies, one that of a woman, and while they were recovering them, the upper part of the house suddenly gave way, burying the men Sells and Spragg. The other four escapees. After about an hour's effort, his comrades rescue Sells, who was found to be suffering from nothing worse than an injured leg. Spragg, however, could not be found until five o'clock the next morning. Although outwardly Spragg was very little injured, his internal injuries were of a very serious nature, and he died after admission to King's College Hospital. The explosion affected the houses 27, 28, and 29, the rear of New Church-court and on the north side of the Strand, all of which were damaged by the flying debris and broken glass.

A LARGE WHEEL FOR BLACKPOOL.—At the annual meeting of the Blackpool Winter Garden Company on the 26th ult., the Chairman (Mr. J. Pearson) said a new dancing-hall, planned on modern lines, had already been commenced, and other schemes to which the directors were not committed included the building of new floor-halls and of a new elevation to Victoria-street. Then, with the consent of the directors, a gigantic wheel, similar to that at Earl's Court, London, would be erected on land at present used as bowling-green. Arrangements had been made with Mr. Bassett, the engineer and builder of the Earl's Court wheel, and it was proposed that this novelty should be ready for use by next season. Mr. Bassett said the new wheel would not be so large as that now working, but it would accommodate more people at one time, its capacity being four revolutions per hour, during which time it would carry 5,000 people.

RECREATION - GROUND, BILSTON, STAFFORDSHIRE.—A new recreation-ground, formed by the conversion of a disused graveyard attached to the Wesleyan Chapel, Oxford-street, Bilston, has just been opened.

NEW PARK, DEVONPORT.—On the 28th ult. the People's Park, Devonport, was opened by the Mayor (Mr. J. Bright James). Acquired a few years ago from the War Department, the freehold of the site is now vested in the Corporation, under whose direct supervision its appearance has been transformed into a picturesque spot, the outlay, including the conveyance, being about 10,000*l.* The grass plots have been relaid and planted by Messrs. Veitch & Sons, of Exeter, and intersecting paths have been formed.

IMPROVEMENTS AT BRIDLINGTON.—Several public improvements are to be carried out at Bridlington. A sea-wall is to be built, and upon it a promenade and marine walk, 36 ft. wide, and extending for a considerable distance, will be laid out. A coping bank of grass will divide this from the other wide promenade, flights of steps connecting the two. On a level with the second promenade gardens and lawns, with ornamental lake, fountain, and stand, tennis-court, alcoves with sheltered seats, will be laid out and erected. A hall or sheltered promenade will be attached. A range of refreshment huts will be provided, and the grounds will also be provided, including a winter garden and a concert-hall, each capable of accommodating 3,000 people. A building will also be set apart for dancing. Reading, writing, and newspapers, and a visitors' club with billiard-rooms will be attached. Ample dining-rooms, tea-rooms, and refreshment huts will be provided; sea-water and a promenade pier are amongst the future objects. Hilderthorpe Lodge and the grounds attached are to be laid out as strawberry and tea-grounds, with athletic ground, bowling-green, and conveniences for other amusements. The whole of the gardens and buildings will be lighted by electricity and gas, in a similar style to that adopted at Hildesburgh. Electric tramways will be laid throughout the estate. Mr. W. Beswick, of Fife, has had charge of the plans.

FUTURE EMPLOYMENT FOR ENGINEERS.—At a meeting of the Engineering Society of the University College, Bristol, on the 24th ult., Professor James gave a lecture on "The Chances of Future Employment for those Intending to become Engineers." The lecturer said that the trade was now beginning to revive, the reasons being—(1) People are recovering from the crashes in 1890, and were coming venturesome again; (2) The new Government were spending large sums on new vessels for the Navy, &c., and this led to developments in the iron trades, also it provided work for the many mechanics who, through lack of employment, had not been earning money, and therefore did not begin spending it. All this would help towards fresh industries being started, and old ones revived, which in their turn would provide work for engineers in the future. The Professor then went on to say that they had a better chance than architects and lawyers, since they made work for themselves. For instance, a railway might be constructed in a rich country, other work would immediately spring up, new towns be created, machinery, ironwork, repairs and renewals for the railway would be wanted, all of which would have the desired effect. This, he said, was only one instance out of many. In the case of a doctor, his profession was for the one purpose of ridding the world of sickness, and then as sickness and other influences became perfected, and doctors would have less to do until sickness was no longer found upon the earth. In regard to the manufacture of mild steel by the Bessemer and Siemens-Martin processes, before those methods of manufacture were devised, steel cost as much as 100 per ton, whereas now the price was nearer 40s. a like quantity. This allowed of such underlings as the Forth Bridge being carried out. Also, the Professor pointed out that for the manufacture of steel by those processes pure ore was an advantage. It had led to Bilbao, in Spain, being converted from a small town into a flourishing seaport, for in the space of a distance over two million tons of ore were annually exported, chiefly for the purpose of being ultimately converted into mild steel. HONOURS TO AN ENGLISH PAINTER.—Mr. Honore Forbes has received a first-class medal at the Munich Art Exhibition. We may be glad that a country was represented by an artist who illustrates some of the most special excellences of the modern school of English painting.

CAPITAL AND LABOUR.

SCOTCH BUILDING TRADES' FEDERATION.—The annual meeting of this federation was held on the 23rd ult., in the Building Trades' Exchange, Gordon-street, Glasgow. There was a large attendance of representatives, the following places being represented:—Aberdeen, Alloa, Dumfries, Dundee, Edinburgh, Falkirk, Glasgow, Kilmarlock, Motherwell, Perth, Broxburn, &c. Mr. David Heron, Secretary, Mr. James L. Selkirk, read a report on the executive on the progress made in promoting the federation throughout the country, in which it appeared that every local association had been communicated with, as well as a large number of the leading firms in the neighbourhood in the principal towns throughout Scotland, and had been furnished with copies of the rules of the federation, and with full information regarding its objects. Gratifying responses were reported as having been received from most of the leading centres, and evidence was furnished that the federation was warmly approved, was fitted to render substantial assistance to the local associations, as well as to promote the formation of such in those towns where they did not presently exist. The secretary read a paper on federation: its Objects and Advantages," in which he said that one of the leading characteristics

of the present day was the growing tendency on the part of those who had interests in common to draw together and secure the benefits inseparable from combined effort. The building trades constituted one of the most important industries of the country, and included numerous branches, some of the principal of which had separate organisations, and had derived much advantage therefrom, but the lesser towns were generally found too small to render a local association of practical value. For some time past the necessity for a federation of the various branches of the building trades had been impressed upon the leading firms all over the country, and this feeling took definite shape some months ago in the formation of the present federation. Its main object was the formation on a distinct basis of an organisation which should embrace within its limits every branch of the building trades in Scotland, directed by an executive representative of the whole body.

By this means united action on all matters affecting either particular branches of the general body could be satisfactorily taken. Such an object was obviously as legitimate on the part of the employers as on that of the operatives, especially as they had large interests at stake which they were entitled to safeguard. The federation was further intended to promote the maintenance of cordial relations between employers and operatives, keeping in view the fact that the parties were independent and their interests identical, and how much it was in the power of each to render the connexion something more than a mere pecuniary one. The cultivation of a feeling of thoughtful consideration it was believed would immensely promote due respect for each other's judgment and motives, so also would frank view and occasional interchange of view on questions of common interest, and above all, readiness to refer to third parties those questions of importance in regard to which they were unable to see eye to eye. The labour problem was undoubtedly complex and far-reaching as well as of unusual magnitude. All the more, therefore, did it call for careful consideration, so that in circumstances of difference a solution might be arrived at without on either side the serious drawback resulting from inability to agree on main issues. No small part of the object to be gained by federation was the assistance and advice that might be rendered in the formation and working of branches in towns and districts. A hopeful movement has commenced in this direction, and there was every prospect that it would go forward until the entire country was organised. The relations of the building trades to architects and measurers, it was considered, could not be overlooked. While for the most part these were regarded as of a satisfactory kind, it would be the duty of the executive to use their influence on all fitting occasions to secure a fair and reasonable form of contract, the adoption of suitable rules for measuring work, and the prompt and satisfactory adjustment of contractors' accounts. A general discussion followed, in which a number of representatives reported on the state of matters in their several towns, and numerous suggestions were made for the purpose of furthering the interests of the Federation, and particularly as to the formation of local associations. On the motion of Mr. Peterkin, Aberdeen, seconded by Mr. Hay, Edinburgh, the report was unanimously adopted, and the Secretary's paper was ordered to be printed and circulated. Various matters were remitted to the executive to be dealt with. Proceedings terminated with a vote of thanks to the Chairman.

NEW BRANCH OF THE NATIONAL ASSOCIATION OF OPERATIVE PLASTERERS, MANSFIELD, NOTTS.

A new branch of this Association has just been opened at Mansfield. A deputation from the Nottingham District, consisting of Mr. W. Morgan (President), Mr. H. Eaton (Vice-President), Mr. J. Daly (Secretary), and Mr. M. Daly (President of the Nottingham and District Building Trades Council), were present to perform the opening ceremony on behalf of the executive council. A large number of applications for membership were received.

BURY BUILDING TRADES' FEDERATION.—The monthly meeting of the Federation was held on the 16th ult. at Bury. The President, Mr. J. Lacklison, occupied the chair. Mr. J. Davis moved, seconded by Mr. D. Riley, that a sub-committee be appointed to revise rules and lay the same before a future meeting for consideration. It was resolved that the President, Mr. F. Martin, Mr. A. Spencer, along with the Secretary, be appointed the committee. A discussion took place with respect to the Masons' Society not being federated, and after some discussion the Secretary was instructed to write to them. The Slaters' delegate having reported several matters in connexion with their branch, the meeting was brought to a close.

LEGAL.

IMPORTANT POINT UNDER THE LONDON BUILDING ACT, 1894.

CASE IN THE DIVISIONAL COURT.

The case of Tanner v. Oldham came before Mr. Justice Cave and Mr. Justice Wright, sitting as a Divisional Court of Queen's Bench, on Saturday last, it being an appeal by way of special case from

the refusal of a Police Magistrate to convict under the London Building Act, 1894. The question which arose was whether a contract made before the passing of the Act of 1894, to erect a series of houses from year to year, came within the exemption in Section 212 of a contract entered into before the passing of the Act, under which a building, structure, or work is to be carried out.

The case stated that the respondent, a builder, on March 10, 1895, served on the appellant, who is the District Surveyor under the London Building Act, 1894, for the district of Hatcham, a notice which stated that he (the respondent) would build five dwelling-houses on the north side of Musgrave-road, in St. Paul's, Deptford. It appearing to the Surveyor that the houses proposed to be erected would be in contravention of the Act of 1894, he served a notice of objection under Section 150 of the Act. It was stated that the buildings proposed to be erected would be in accordance with the Building Acts in force before the Act of 1894 passed. On April 5 the respondent appealed to the Magistrate against the notice of objection. It was then proved that, under a building agreement of January 3, 1894, made between the Master and four wardens of the "Fraternity of the Art or Mystery of Haberdashers" and the respondent, the respondent agreed to erect not less than forty-three dwelling-houses, to be built of such classes and descriptions, in such position, in such manner, and otherwise as should have been previously approved of by the company's surveyor, and it was agreed that five of such houses should be erected on the north side of Musgrave-road, should be built at a cost of not less than 380*l.*, and that the plans, &c., should, previously to the commencement thereof, be submitted to and approved by the surveyor. It was also agreed that six houses should be finished before March 25, 1895, ten more in 1896, 1897, and 1898, and the remainder in 1899. It was also further agreed that all the works should be executed in accordance with the regulations of the Metropolitan Building Act and any other Act of Parliament, whether local or general, for the time being, affecting the premises. Section 212 of the London Building Act, 1894, enacts as follows:—Notwithstanding anything contained in this Act, a building, structure, or work which has been commenced before and is in progress at the commencement of this Act, or which is to be carried out under any contract entered into before the passing of this Act, may be completed subject to and in accordance with the provisions of the Acts relating thereto as are in force immediately previous to the passing of this Act.

Mr. Cripps, Q.C., who appeared with Mr. Dalry for the appellant, argued that the contracts exempted from the provisions of the Act of 1894, by Section 212, were not contracts such as that which had been entered into in the present case. The words of the Section, "Building, structure, or work," pointed to a contract for carrying out a particular building, and did not apply to a contract of such a general character as the present, which was to be in force for four years. The learned counsel said that it was not impossible that there might be contracts to take effect for a much longer period still. Again, the contract provided for fresh acts becoming applicable.

After hearing Mr. Jeff, Q.C., who appeared with Mr. J. P. Grain for the respondent, Mr. Justice Cave, in giving judgment, said that although the point was a small one, inasmuch as there was not much to be said about it, it was an important one. They (their Lordships) were asked to hold that the word "contract" in the Section meant specification, but if that had been intended it would have been very easy to have said so in the Section. The words, however, were very wide, and the contract in question came within them. The provision in question came about the buildings being executed in accordance with any Act of Parliament for the time being affecting the premises did not carry the matter further, because the real question was, whether the Act applied to the contract at all. In these circumstances he thought that the decision of the magistrate was a right one.

Mr. Justice Wright concurring, the appeal was accordingly dismissed.

LONDON BUILDING ACT, 1894:

WOODEN BUILDINGS.

On the 23rd ultimo, at the Southwark Police-court, Mr. C. S. Burtwell, of 14, Harper-street, New Kent-road, appeared in answer to two summonses taken out by Mr. Bernard Dicksee, District Surveyor for East Newton, &c., firstly, for erecting a building or structure without having given notice to the District Surveyor, as required by Sec. 145; secondly, for having erected a wooden structure without having previously obtained the licence of the County Council, contrary to Sec. 84.

Mr. Dicksee gave evidence to the effect that on the 14th ultimo he discovered that the defendant had erected a wooden building or structure 6 ft. 2 in. by 5 ft. 7 in. by 7 ft. 6 in. high, roofed with corrugated iron, which had since been mounted on wheels. The defendant had not given him the necessary notice nor obtained the necessary licence from the Council. This was the second time that he had had to complain of the defendant putting up similar erections without giving notice, and had on the previous occasion warned him.

Mr. Fenwick, as defendant had previously been warned, fined him 40s. and costs in each case.

LONDON.—For heating with small-bore pipes the Congregational Church and School, Law-sham H.C. road, S.E. Mr. George Gainer, architect, 4 Great Winchester-street, E.C.—
 Church Schools
 W. Stanton £212 0 21 15 21 15
 A. M. Perkins & Son 104 0 130 0 204 0
 J. Wonnor Smith, Gray, & Co. 101 0 94 15 85 15
 Musgrave & Co., Ltd. 131 10 95 0 226 10
 J. L. Bacon & Co., 34, Upper Gloucester-place, London, N.W. 108 0 84 0 192 0
 * Accepted for schools only at present.

LONDON.—For reinstatement of Messrs. Lloyd & Sons' premises, Mid-street, Dockhead, S.E., after fire. Messrs. Geo. E. Hocking & Son, architects.—
 Holloway Bros. £100
 R. Wells 109
 J. Greenwood 741
 H. Wells & Son 875
 Bartley, Son, & Holness 735

LONDON.—For the erection of four one-story shops and new entrance to chapel in front of the Union Tabernacle, Wandsworth-road, S.W. Messrs. R. Price & Son, surveyors, Clapham.—
 Thos. Ford £712 0
 C. Camick & Son, St. James's £409 0
 E. J. Williams 279 10
 * Accepted.

LONDON.—For alterations to lavatories and erection of engine-house at the workhouse, St. Leonard's-street, Brompton-by-Bow, E., for the stepney Union Guardians. Mr. G. E. Houlton, architect, 4, King's Bench-walk, E.C., and 109, Bow-road, E. Quantities by Mr. A. K. Ball, 118, High Holborn, W.C.—
 W. G. Holland £247 10
 G. Wales, Hackney* £3,302
 Atherton & Dalman 250
 A. Symes 2,823
 T. White & Son 812
 A. Wadsworth 2,119
 C. L. Cole 3,368
 * Accepted.

LONDON.—For exterior painting and pointing at Tottenham-road Board School, for the School Board for London. Mr. T. J. Buxey, Architect.—
 D. Gibb & Co. £318
 C. Willmott £205
 H. Knight & Sons 231
 Marhaat & Hirst 199
 C. Munday & Sons 231

LONDON.—For making new saloon bar and sundry alterations at the "Adelaide Tavern, Chalk Farm, for Messrs. Wilson & Son, Mr. A. J. Fernan, architect, 51, St. John's Villas, N.—
 E. Venn £2,687
 G. G. Brand £2,447
 Marchant & Hirst 510
 [Architect's estimate, £551]

LONDON.—For repairs, &c., to 76 houses and shops, in Plimco Walk, Finsbury-street and Aske-street, Hoxton, for Mr. T. Arno, Mr. A. J. Martin, architect and surveyor, 380, Old-street, E.C.—

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	Total
Pringle	476	990	0	255	0	0	1,721
Goodall	375	0	0	70	0	0	445
Hood	418	716	0	585	0	23	1,742
Clark	214	0	0	885	0	11	1,110
Webb	203	745	10	54	10	0	1,512
Speight	0	0	0	0	0	0	0

* Surveyor's fees. † This was an informal tender.

LONDON.—Accepted for sundry alterations, decorative and sanitary works, at 38, York-terrace, Regent's Park, N.W., under the superintendence of Mr. Frederick Colyer, 35, Great George-street, Westminster S.W.—
 Alterations and Decorations.—Blythe & Co. £531
 Sanitary Works.—Dent & Hellyer 995

LONDON.—Accepted, at perschedule of prices, for pulling down and part rebuilding at No. 31, Charlotte-street, Fitzroy-square, W., for Mrs. Gray. Mr. G. Gordon Stanham, architect, 10, B. Queen Victoria-street, E.C.—
 John Appleby, Cornwall-road, S.E., and Richmond.

LONDON.—For rebuilding the retaining wall on the east side of the approach to the mansion in Cusculd Park, and of repairing and painting the wall and painting the railing on the opposite side of the approach, for the London County Council.
 C. E. Jeffries £217 14 6
 Holland & Hooker £118 10 0
 W. Wells 116 0 0
 W. Williams & Son 513 0 0
 A. Wallis 118 0 0
 W. Shumway 120 0 0
 * Accepted.

PORTSMOUTH.—For the erection of a block of buildings at the Royal Fort, Portsmouth and Gosport Hospital. Mr. A. H. Bone, architect, Cambridge Junction, Portsmouth.—
 E. & A. Springers £1,757
 Crockerell £1,643
 Cerkins 1,679
 Jones, Scutcheon* 1,591
 * Accepted.

TENBY.—For additions to "Bellfield," Tenby. Mr. F. L. Pether, architect, London, W. Mr. Bernard Swinestead, surveyor, London, W.C.—
 Stephens, Bastow, & Co., Ltd. £2,920
 D. Jenkins 2,600 0
 Davies Morgan 2,788 0
 Williams 2,493 0
 Phillips & Owens 2,350 10

TO CORRESPONDENTS.

A. H. (too late: next week).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.
 We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.
 All communications regarding literary and artistic matters should be addressed to THE EDITOR. Advertising advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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 Each additional line (about ten words) 6d.
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 Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

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 BETHNAL GREEN, LONDON, E.

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47 and 49, ST. ENOCH-SQUARE.

The Builder.

VOL. LXIX. No. 2753

NOVEMBER 9 1895

ILLUSTRATIONS.

Design for a Public Library.—By Mr. Percy E. Newton	.....	Double-Page Photo-Litho.
New Picture Gallery, 2, Holland Park-road, W.—Professor Aitchison, A.R.A., Architect	.....	Double Page Ink-Photo.
Selected Design, Llandudno Municipal Buildings.—Mr. T. B. Silcock, Architect	.....	Double-Page Ink-Photo.
Dominion House, Fenchurch-street, E.C.	.....	.....
West India House, Leadenhall-street, E.C.	.....	Two Single-Page Photo-Litho's.

Blocks in Text.

Block Plans of Pre-Conquest Churches	.....	Pages 335, 337	Plan, Llandudno Municipal Buildings	.....	Page 337
Plans, Design for a Public Library	Page 337	Section, Design for a Public Library	Page 336

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Mr. Lethaby's Architectural Gospel.

HE two lectures on "Modern Building Design," delivered on the two previous Saturday afternoons in a small room in the corner of Bolt-court, will probably leave their mark behind them. Mr. Lethaby has more than one claim to serious attention. He is a beautiful draughtsman and a fine designer though we presume that on his own principles he would repudiate these qualities, he has an intimate practical knowledge of work and materials, and he has the literary faculty which enables him to put what he has to say in a striking and picturesque manner. But beyond all this, Mr. Lethaby is manifestly in earnest. This is an age of humbug; and when we come across a man who speaks from his heart, and who thoroughly believes what he says, let us take much of him, and get all we can from him.

However much we may differ in some points from the view adopted in these two lectures, there is something eminently healthy and bracing in the stand which Mr. Lethaby makes against the pretence, the shyness, and the merely trade conditions, which the architectural and building practice of to-day are so largely and painfully characterised. That nothing worthy "architecture" can come of erecting buildings with the main object of getting a money return for them as fast as possible, getting out of a contractor the best price that can be made in work and materials for the least money, is what we have more than once said as plainly as possible in these pages, and it was with full sympathy that we listened to Mr. Lethaby's merciless sketch of the various grades of people who are nowadays interposed between the person who orders the building and the people who actually build it, down to the builders' foreman who might actually build it if he were not almost entirely occupied with time-sheets and the effort to save a margin of profit for his employer. As Mr. Lethaby says, and as we have before said, the person called the builder frequently, in the present day, knows nothing of the building; he estimates on the quantities, and is merely a kind of agent for dividing labour and materials. Every word

that Mr. Lethaby said on this subject we endorse. The competition system of tendering is so vicious, so utterly subversive merely of sound and honest workmanship, to say nothing of architecture, that there must be a re-action against it before long; it is an absurdity that will over-reach itself.

The suggestion that we should study past styles of architecture not in regard to their external features but in regard to their methods of construction and the manner in which the constructional problems which their builders had to deal with were met, though it looks rather like turning architecture inside out to see what it is made of, certainly suggests a side of the study of ancient architecture which has been neglected, and is a hint which may well be borne in mind by architectural students. At the same time we cannot but see that not only is this constructive side not the whole, that in many cases it is not the most important element in ancient architecture. The constructional problems of the Greek temple were of the simplest kind, and are such as are found in many other buildings in other countries and periods; the qualities which differentiate Greek architecture are not those of construction but of design, of architectural treatment in the usually accepted sense of the word. Still, it is well to be reminded that we have hitherto studied ancient architecture too much from the outside. Also there is much wholesomeness in Mr. Lethaby's exhortation that we should just throw away the conventionally-accepted cornice mouldings, egg-and-tongue ornaments, and other items in the architectural property-shop, and commence to think out anew the treatment and expression of the constructive features of building. It may hardly be possible to follow such advice literally and entirely; we cannot altogether escape from the influence of details which have been used for many centuries; but to endeavour at all events to think out anew the expression of construction is a wholesome discipline to the mind, and may lead to more of new and living interest in architectural expression than we can realise till the experiment has been fairly tried.

That we should regard it as a main object to ensure that all building should be carried out in the best manner, rather than seek to dignify certain more expensive buildings with the title and rank of "architecture," is no doubt a most healthy view to propound, and strikes at the root of all the bad and

jerry building of the day and of all time. But it does not follow from that there may not be, as there always have been, buildings for special objects which aim at something far beyond what is merely good building; which are erected for the express object of producing grand and sumptuous architectural effect, and striking the imagination and the poetic sense; and this effect must be achieved by something beyond mere good construction, by that treatment of architectural "features" which Mr. Lethaby so much deprecates. What are the capitals, the special design of the columns &c., which give their special effect and expression to Greek temples, but architectural "features?" The columns are a necessary part of the construction, but the special treatment of them is not; it is done for architectural effect. And if we could see the ordinary houses in which the poorer classes at Athens lived at the same time that the temples were erected on the Acropolis, it is likely enough that we should find they were very poor structures, built in a cheap manner, though perhaps not as bad as the modern speculating builder's cottages. It may be doubted whether there ever was a time when the ordinary every-day building of a country was, as a rule, carried out as well as its larger architectural monuments. We see fine and strongly-built old cottages in this and other countries no doubt; but it is probably the best built examples which have survived; we do not know how much rubbishy building of this kind may have disappeared. Nevertheless, the plea that we should begin at the base and endeavour first to have all building good, sound, and well executed, is a noble one, and we can only thank Mr. Lethaby for so strongly insisting on it.

The idea of the harmony between architecture and nature, another point which Mr. Lethaby eloquently insists on, may in a certain sense be pressed too far. Certainly Versailles is not the highest type of architecture, but we do not know that the mere complaint that it is not in harmony with nature is a valid ground for condemning it. It does not appear to us that the Greek temples are much in harmony with nature; they are a separate creation of a highly artificialised type. English Gothic cathedrals are to a great extent in harmony with nature; French cathedrals (which many maintain to be the finer examples) are not; they are in harmony with the towns out of which they

rise, and the houses which crowd up to their bases and nestle among their buttresses. Versailles might have been carried out in a much higher and nobler type of architecture, and yet have stood entirely, and excusably, apart from nature. The whole domain was an artificially created "pleasance" on a great scale, and Louis XIV. selected a very unpromising area of flat land, and handed it over to le Nôtre to work on, with the express object of showing what art could do to beautify a place which had no natural attractions.

Mr. Lethaby's idea that we should regard nature from a "pattern" point of view no doubt suggests the only manner in which nature can be regarded as the originating suggestion for ornament. It is the way in which a decorative designer must regard nature if he wishes to take suggestions from it; in that relative sense it is correct; in a positive sense it is hardly the best way to look at nature, and we certainly cannot regard the sampler with the trees and stags worked on it as a reproduction or reminder of nature which is to be considered comparable with a painting of Turner's. And Mr. Lethaby himself seems to depart from this "pattern" view of nature in the passage near the end of his second lecture in which he says, speaking of the necessity of avoiding the too rigid application of geometry, "we are ready to admire this method of design in a tree, but repudiate it in building." That is Ruskin's old rhetorical fallacy of "the clerk of works' tree" in another form. A column and a tree are objects belonging to different categories, and the one cannot be a model for the other.

The statement that the best architecture has always been erected where there were no architects except foremen-masons, paid a little higher than the other workmen, will we think hardly bear investigation. It may be true of the Mediæval buildings; we more than doubt whether it is true of Greek and Roman buildings. A passage in the Pseudo-Platonic Dialogue *Epaorai* (B.C. 135), appears to offer indubitable evidence on this point in regard to Greece. *Ὅτις ἐν τῇ τεκτονικῇ, . . . τίκτουσι μὲν αὖ πρῶτον πέντε ἢ ἑξ μὲν ἄλλων ἀρχιτεκτονῶν δὲ οὐδ' αὖ μνησίων ἑταίρων. Ὅλλοι οὖν καὶ ἐν πᾶσι τοῖς Ἑλλήσι γίνονται.* "As to building . . . an ordinary builder (or building foreman) may be secured for five or six minæ (about 17*l.* to 22*l.*), but an architect not for less than ten thousand drachmæ (about 350*l.* roughly; or it may mean merely 'a very large sum'). But there are very few such architects in all Greece." No doubt Mr. Lethaby may quote the last sentence as to some extent in his favour; but the whole quotation at all events shows that architects were a class apart and were very highly paid. Vitruvius is evidence that architects were a recognised professional class in Rome; and Mr. Lethaby's own remarkable book on St. Sophia seems to us to show that the design of St. Sophia was the personal conception of Anthemius of Tralles.

We cannot pay much respect to the authorities cited by Mr. Lethaby in favour of his views as to the uninteresting character of architects' architecture. Mr. Mahaffy is an authority on Greek literature and social life, not on Greek art. M. Daudet is a brilliant and very cynical French novelist, who was invited by the editor of an architectural journal to express his views on architecture, and replied by some cynical remarks, as he would probably have replied on any other subject on which his opinion had been asked. Your French man of letters of to-day is nothing if not cynical. Mr. Morris is a pronounced Socialist, who regards everything to-day, architecture included, as rotten, and his gospel is a gospel of despair and negation. And as to Mr. Ruskin, in our opinion the citing of his views on architecture is a form of argument entirely *passé*. A very careful examination of the "Stones of Venice" and some

others of his works on their recent re-issue convinced us that he has no fixed principles on architecture at all; that what he says on one page he will unsay on another; that he knows nothing about construction; that he is a blind guide in regard to architecture, excelling only in the faculty of uttering brilliant and stirring rhetorical sayings; and we think the world is beginning to find him out, or will do so before long.

In conclusion: it must not be forgotten that we are now in an entirely different position from that of the Mediæval builders; we have all architecture open to us by history and travel, and we cannot any longer work in the spontaneous and instinctive manner in which the builders of Mediæval cathedrals are said to have worked; we must exercise an intellectual choice. Even Mr. Lethaby's own suggestion that we should reduce building construction down to its simplest form, and develop it anew, implies the exercise of such a choice. And under such circumstances there must be one directing mind. Architecture has become, like engineering, a personal art; and the fact that the architect does not work with his own hands on the building is nothing to the purpose. Look at engineering; the greatest structure of the century is the Forth Bridge; does anyone suppose that the distinguished engineer under whom it was built did a stroke of hand-work on it himself, and yet does anyone question that the credit of the Forth Bridge is due, first and foremost, to Sir Benjamin Baker? And on what ground, then, is architecture to be regarded as merely the work of the artisans?

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND

By PROFESSOR BALDWIN BROWN.

IV.—The Place of Saxon Structures in the General History of Mediæval Architecture. PART II.—Cruciform Plans and Towers.



WE turn now to the consideration of the interesting group of Saxon cruciform churches already referred to, of which the most conspicuous member is St. Mary's, Dover Castle. This exhibits the plan given in fig. 11 (on p. 216 *ante*), where we see an aisleless nave, a square-ended chancel, transepts, and an imposing square tower over the crossing. A similar plan, so far as can be judged, was adopted at Stow in Lincolnshire, Norton, co. Durham, Stanton-Lacy, Shropshire, and Repton, Derbyshire. Worth (fig. 10, *ibid.*), and Deerhurst, Gloucestershire, are, or were, cruciform churches with apsidal terminations, but without towers over the crossing. Most of these buildings present no special marks of great antiquity; but the oldest parts of Stow, the transepts, are believed by some of our best authorities to date from the early period of the bishopric of Lindsey, established in 678, and to show to this day on some of their stones marks of a burning by the Danes in the year 870. At St. Mary's, Dover Castle, materials, workmanship, and details all seem to point to a very early date of erection, and induced Canon Fuckle, in his well-known monograph on the church—he calls it "a basilica-like pile"—to ascribe it to the fourth century. Mr. Romilly Allen ("Monumental History," p. 184), classes it with Brixworth, and Sir Gilbert Scott accepts it as "one of our oldest remaining pre-Norman English churches" ("Lectures," II., p. 19), though further on (p. 44), he inclines to a later period. Most writers, including Bloxam ("Principles," 11th ed., I., p. 39), have agreed to this early ascription, which seems to have been acquiesced in at the Congress of the British Archaeological Association at Dover in 1883 (*Journal*, Vol. XL., p. 235). On that occasion, however, Mr. J. T. Irvine expressed the opinion, derived from technical considerations, that the workmanship was not prior to the tenth century. This, as we shall see, is very likely to be

true, but it is not really a question of technique but of general plan, and a consideration of this is quite sufficient to remove the building at once out of all connexion with the fourth century, and to make more than doubtful its ascription to the seventh, when, according to the most generally received opinion, it was constructed under Eadbalc King of Kent, the son and successor Augustine's convert, Ethelbeht.

The truth is that a cruciform church with central tower, almost exactly conforming to the late Mediæval type familiar to us in Anglo-Norman architecture, would have been at either of these periods an architectural phenomenon, not perhaps impossible, but in the highest degree unlikely. We are so familiar with the form of the Latin cross as a normal plan for our churches that we are apt to forget that in early Christian and early Mediæval times any approach to was quite exceptional, and that it only began to come into use as a recognised scheme subsequently to the Carolingian epoch.

Among those exceptional Early Christian buildings, which we have seen to be so important for the future of Western architecture, were certain cruciform monuments intended primarily for sepulchral chapels. The cross-shape had been used for tombs by the Romans, and it is to be found in the Christian catacombs. When Constantine erected in his new capital a sepulchre for the Imperial family he adopted the form of cross, and dedicated the building in the name of the Apostles. Though Constantine's church has perished, an Apostles' Church which seems to have been a copy of it, was erected at Milan at the close of the fourth century by St. Ambrose, and the plan of has survived in the later Milanese structure of San Nazario Grande (fig. 22). The famo-

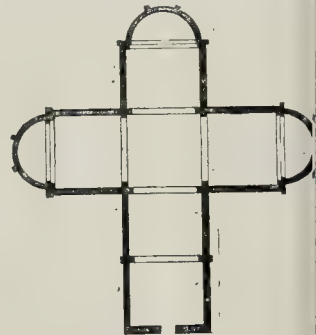


Fig. 22.—S. Nazario Grande, Milan.

tomb of Galla Placidia at Ravenna, of the fifth century, is an example on a small scale of the same form. With these buildings in existence it is conceivable that a Christian architect at any period might have boldly seized upon the scheme for the purposes of a church for congregational use, and if it is claimed that this was the case in the seventh century at Dover and at Stow, it is impossible to do the abstract possibility of such an achievement. That it is in the highest degree improbable the following considerations will show. The history of Mediæval architecture is quite silent as to any use of the form in other lands in the centuries from the sixth to the ninth. We know of no example subsequent to the Early Christian epoch until after the time of Charles the Great, when the Romanesque period may be said to have opened. It is true that the description in *modum crucis* is applied more than once to early churches among the Franks, but these appear to have been T-form buildings in the shape of the *crux commissa*, a cross without a head, as in the original Church of St. Denis, erected by Dagobert about 628 A.D. (fig. 23). The *crux imposita*, or complete Latin cross, shows itself for the first time in the Middle Ages in the scheme of the church on the plan of St. Gall, dat-

out 820 (fig. 24). The cruciform plan is here not complete, but, as it were, in process of formation; while it is more pronounced at Hersfeld (fig. 25), the plan



Fig. 23.—St. Denis (circa 628).

which seems to date from about the middle of the ninth century. Even in the scheme is confined to the eastern part of the Carolingian realm, for the searchings of Dehio and von Bezold

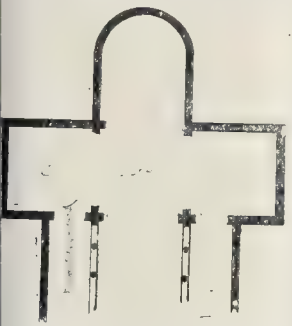


Fig. 24.—St. Gall (circa 820).

die Kirchliche Baukunst des Abendlandes" failed to find any example in Gaul or earlier than the eleventh century, when come upon the pronounced example of the Cathedral of Pisa. Why it was that this

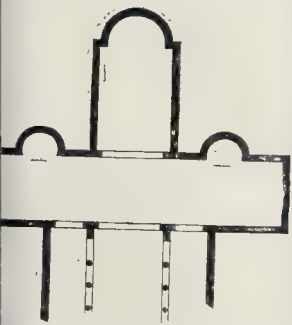


Fig. 25.—Hersfeld (probably about 840).

ne, destined as it was to become practically universal in the later Mediæval epoch, did appear in early Christian times, but the long intermediate interval should pass completely out of use, we cannot tell. To that the Saxon churches we are content with fill up the void, is flattering to national vanity; but on sober consideration seems very improbable that a scheme so startling contrast to the normal plan should have been transported from Milan to England in the sixth or seventh century, while it left of its passage on the architecture of mediæval countries, such as Gaul, the land, or further Germany.

Other argument of a more technical leads in the same direction. The early cruciform monuments are formed on the model of the Greek Cross, that is to say, though the nave may have additional

length, the transepts and choir and nave are of the same width, height, and general importance. Had the Saxon buildings in question been derived directly from these, the same relation of parts would appear in them also, whereas, as a fact, in the majority of our cruciform churches these ratios of size are curiously varied. The relation between the size of the square of the central tower and the width of the arms of the cross, which in the early Greek-Cross plans is always one of equality, varies in the Saxon examples, and will be referred to later on. The transepts at St. Mary's, Dover Castle, are notably inferior in height and width to the nave, while the chancel is intermediate. At Worth the same relation holds, but at Peterborough the transept is much wider than the chancel. These two, however, lacked the central tower. Repton, where the former existence of a tower is not quite certain, gives us a narrow chancel and wide nave, with transepts intermediate in size. On the other hand, at Stow and at Norton the four arms of the cross were almost exactly of the same dimensions, and at the latter place the marks of the old roofs on the four sides of the tower correspond in slope and elevation. The side of the tower in both cases is a little wider than the arm of the cross that abuts against it, while at Stanton Lacy, though the present tower is of much later date, these dimensions seem to have been the same.

These variations can be easily understood on the supposition that at the epoch when these churches were built architects were feeling their way towards a consistent cruciform scheme, but were still in the experimental stage. In Germany the Carolingian cruciform church at Hersfeld (fig. 25) has its transepts narrower than the nave, but a little later, as at Würzburg, the dimensions have become the same. Had the scheme been derived directly from the Greek cross of the Early Christian sepulchral chapel, such tentative procedure would be inexplicable. All the probabilities, therefore, seem to point towards a date in the 10th century, when we know that Repton and Peterborough were rebuilt, or the first half of the eleventh, when the more matured Stow was also reconstructed. It is unlikely that the earlier structures on these sites were cruciform, or that St. Mary's, Dover Castle, dates from any earlier epoch. As churches, however, of the tenth century they are still most remarkable edifices and deserve notice in any sketch of European architecture in general, as well as of that of our own country. To us they are specially interesting as exhibiting a scheme afterwards in great favour in the Anglo-Norman period, and as fixing at so early a period the central tower as a characteristic feature of English architecture.

The question of church towers in the Saxon period is an important one, and these prominent features in our early architecture cannot be properly studied except in relation to the general history of the tower in ecclesiastical architecture. Saxon towers are very numerous, and for the most part have a strong family likeness. They were probably erected at about the same period, and this period must have been one in which the tower had already come to take its place as a normal adjunct to the Christian church. The origin and primary purpose of the tower in Christian architecture are admittedly obscure, and all that we can say with any certainty is that the two earliest groups of towers are the campanili of Italy and the round towers of Ireland. The earliest dated tower is the round structure attached to the basilica of Sant'Apollinare in Classe at Ravenna, erected in the years following A.D. 540. Italian church towers are, however, generally square in plan, and date from about the seventh century onwards. The Irish seem to belong to the ninth and tenth centuries, when they were erected as places of refuge and defence in the times of Danish inroad. The theory that the Saxon

towers of England also belong to the Danish period, and were erected for the same purpose as the Irish, is contradicted by the fact that they present no sign of arrangements for the safety of inmates or for the warding off of a foe. One of the tall eleventh-century square towers in Normandy, that of Ver, has, like the Irish towers, its door at a considerable height above the ground, but all the Saxon towers open on the ground level, either into the church or on the exterior.

Except for furnishing this suggestion of an origin the Irish towers are of little use for the study of those in our own country, because, like the Italian, they are independent structures not in architectural connexion with the churches. In Saxon work we have to consider the relation of the tower to the main fabric, and this takes three forms. In some of the larger structures two towers flanked the entrance façade; in the case of cruciform churches a tower often occupied the central position over the intersection of nave and transepts; in simpler buildings a single tower was placed against the western wall of the nave. Sometimes, as at Ramsey in the tenth century, there was an entrance tower, and one also over the crossing. By the use of some ingenuity in conjecture all these uses of the tower may be derived from the central structures of early Christian times, and the following theory possesses a certain consistency and even elegance, though, like other theories of the kind, it must be accepted with reserve. This theory derives the central tower from the cupola or pavilion surmounting the inner space of circular or polygonal buildings like San Vitale at Ravenna; the twin towers en façade from the stair-turrets flanking the entrance fore-building at San Vitale and the Minster at Aachen; the single western tower from this fore-building or porch itself. The use of a cupola or pavilion to distinguish some special part of a church (not necessarily the crossing), occurs very early, as for example in the basilica erected by Perpetuus over the tomb of St. Martin at Tours, about 470 A.D. It is a familiar feature in the cruciform churches of the Romanesque Period in Lombardy and in Germany, and in the later Mediæval Epoch it develops in Germany into a regular tower, as at Bonn. What was the history of our own central towers we cannot tell, and it is doubtful whether they assumed their form in independence of the regular square towers, or whether the latter were first matured and the crossing-pavilion moulded in accordance with them. A feature in these towers, brought into notice by Mr. Hodges, seems to make for the latter alternative. He has pointed out (*The Reliquary*, Jan., 1894, p. 9) that at Norton and Stow, the external width of the limbs of the cross is not so great as that of the central tower, so that the corners of the tower are seen to rise from the ground and continue in an unbroken line from base to summit, the nave, transepts and choir abutting on but not wholly masking the sides of the tower; this arrangement gives a sort of independence to the tower, which suggests that it was in itself a well-understood architectural feature before it was employed in this particular connexion. Had the tower simply grown out of the cruciform scheme, the junction with each other of the four arms of the cross would have been the point accentuated, and the tower would have been used like the Lombard cupola to cover the space already marked by their meeting.

It is not a little surprising at first sight to find that characteristic Romanesque feature, the twin towers flanking an entrance façade, already in existence in the early Christian epoch. Yet this is what we find at San Vitale in the 6th century, and, copied from them, in Charles the Great's Minster at Aachen of 796 A.D. The flanking towers here, it is true, are only stair-turrets, but they needed only to be made more imposing, and used in their upper stories for the hanging of bells, to form the familiar Cluniac façade.

On the other hand, they might shrink instead of increasing, and become incorporated in the fore-building or porch, to the upper story of which they were intended to give access. In this way might be produced those imposing western adjuncts, inclosing within their walls the needful stairways, which form such pronounced features in many Westphalian and Saxon churches of early date, such as Paderborn.

According to the theory we are dealing with, the single square western tower was arrived at by a gradual shrinkage in plan, and elevation in height, of this many-storied porch. According to Dehio and von Bezold the single western tower is the latest form in which this feature shows itself in Medieval architecture, but these well-equipped and conscientious investigators, like continental writers generally, know very little about the early buildings of our country, and a study of Saxon towers might lead them to reconsider some passages in their great work on the ecclesiastical architecture of the West. In Britain there are no indications of huge western adjuncts which might crystallise into towers, but there are, on the other hand, western porches of moderate elevation, which the examples at St. Pancras, Canterbury, and Monkwearmouth show to be among the features belonging to our very earliest churches. What was the primary purpose of these porches we do not know, but they were certainly incidentally used for purposes of sepulture. On the walls of such porches, as at Monkwearmouth and also at Corbridge, in Northumberland (C. C. Hodges in *The Reliquary*, January, 1893, p. 12), towers were at a later period erected, and the position of the tower at the entrance end of the church may therefore be due to the pre-existence of western porches, though these did not themselves actually turn into towers, as the theory demands.

To sum up the results of the foregoing discussion, it may safely be asserted that, so far as ground-plans are concerned (1) those plans which, to all appearance, are non-Roman, like those with the narrow naves and square-ended chancels, and (2) those which like the Basilican plans, correspond with Early Christian work elsewhere, are likely to be the oldest; while forms which, like the cruciform plan, are rather Medieval than Roman, or, as is the case with the towers, do not occur at all in the earlier periods of Christian architecture, are almost necessarily of later date. Arguments as to date founded on details and technique will be considered in subsequent papers, but so far as the criteria hitherto set forth can be made to apply, we may find no reason to doubt that Silchester and St. Pancras are Romano-British, or that Brixworth and Reculver on the one hand, and Monkwearmouth, Escomb, and other churches of similar type on the other, may belong to the seventh or early part of the eighth century. As was pointed out some time ago by a distinguished authority on our early architecture, the late Mr. Loftus Brock, in the *Antiquary* for March, 1881, Saxon churches are not necessarily all of one period, and we must expect to find, beside those of more ancient date, examples comparatively modern. Among these are the cruciform churches, which must be regarded as important landmarks in that development of Romanesque architecture which begins with the time of Charles the Great. The towers are clearly not original elements in Saxon architecture, but it would be rash to fix a date earlier than which no tower can have been built. Most of the existing examples are generally, and no doubt rightly, referred to the early part of the eleventh century, but we know that Ramsey Abbey Church had a central and a western tower in the last half of the tenth.

THE STUDENTS' COLUMN.—Owing to pressure of other matter, we are compelled to hold over our usual "Student's Column" article until next week, when two instalments will be given.

NOTES.

THE Hellenic Society on Monday Miss Harrison read a short paper, illustrated by plans handed round to the audience, on the subject of Dr. Dörpfeld's discoveries on the western slope of the Acropolis at Athens, and his theory as to the real position of the fountain of Kallirrhoe, subsequently called the Enneakrounos. The nature of these discoveries, and the new theory as to the site of Kallirrhoe, have been already fully laid before our readers.* In the discussion which followed the tendency was rather against the acceptance of Dr. Dörpfeld's new topography. Mr. Ernest Gardner, in the course of an interesting speech, pointed out that the "bridal bath," for which the sacred water of Kallirrhoe was in request, was a ceremony analogous to that performed by the bridegrooms who cut their hair and threw it on the Ilyssus stream; that the Ilyssus on this account received the epithet *γαρόπτολος*, as signifying its connexion with marriage-rites, and therefore that the sacred fountain of Kallirrhoe would naturally be near the river; and he observed that the question was not so much whether we could make the description in Thucydides suit Dr. Dörpfeld's site, as whether anyone reading the passage in Thucydides without any commentary would naturally attach the meaning to it which Dr. Dörpfeld wished to give it. The undoubted fact that Kallirrhoe was near the temple of Dionysos Lenaos, called the Temple "in the marshes," raised another question in topography, most of the speakers urging (not unnaturally) that "the marshes" would have been more likely to exist on the lower level near the river than in the hollow near the Acropolis where Dr. Dörpfeld places the site. Mr. Myers, however, who treated the subject from a geological point of view, thought the lower ground had been so much altered and covered by *dhbris* that a further examination of it would be required to settle this, and he was of opinion that Dr. Dörpfeld's site had certainly been a very damp hollow, if not exactly "a marsh." The general opinion seemed to be that the phrase in Thucydides, *πρὸς τοῦτο τὸ μέρος* (see conclusion of the first article in our issue of September 7), could not bear the interpretation put on it by Dr. Dörpfeld, and that the ancient extension of the city was, according to the usual reading, southward and not westward of the Acropolis. Miss Harrison replied on some of the points raised. Although the discussion was in the main hostile to Dr. Dörpfeld's topography, about which we feel very doubtful, it must be admitted that he has scored two points: "Dionysos Lenaos" was Dionysos "of the wine-press" (*Ἀνός*), and he has found a wine-press †; there was an inscribed stele erected in the precinct of the temple, and he has found an altar-stone with the mortise in which a flat stele was evidently set. It will be at all events interesting to see what further evidence turns up, on the continuation of Dr. Dörpfeld's excavations.

AS we have called attention more than once to the delay in making any use of the waste space on the site of the old "Her Majesty's Opera," and the public injury done by leaving the site in this state, we are glad to hear that, after a great deal of negotiation, the site has been definitely acquired for the purpose of erecting a grand opera house, restaurant, shops, and club chambers. Plans approved by the promoters of this scheme have been prepared by Mr. Walter Emden, and the building operations will shortly be commenced. It is to be hoped that the result may be not only a well-planned theatre and convenient chambers, but that the exterior of the building may be architecturally worthy of such a fine and prominent site.

* See *Builder* of August 31 and September 7 of this year.
† See plan on page 164, ante.

A "MUSEUM" SUNDAY, that is Sunday on which a number of private galleries and collections are thrown open to the public, is a reasonable way of emphasising the desirability of the Sunday opening of museums. But it is doubtful if the carrying of the movement into the churches is desirable. It is apt to offend a certain number of persons, and it does next to nothing to advance the cause which it is desired to advocate. The opening of Sundays of public collections must necessarily be obtained by producing a change in the entire public feeling, but sermons from some few pulpits once a year will add nothing to the necessary momentum. The movement is progressing, it has become more evident to many who formerly opposed it that the opening of museums and picture galleries on Sundays affords better means of passing a harmless afternoon than do public-houses, and that the pernicious influence of the latter must be combated by some active means such as the opportunity for seeing works of art.

A NEW formula for determining the flow in sewers and water-mains has been devised by Messrs. W. S. Crimp, M.Inst.C.E., and C. E. Bruges, A.M.Inst.C.E., and will be found fully explained in the last volume of the "Proceedings of the Institute of Civil Engineers." The fundamental formula relating to the flow of liquids in channels is that of Chezy, in which $v = c \sqrt{rs}$, where v = the mean velocity in feet per second, r = the hydraulic mean depth, s = the surface inclination, and c = a co-efficient. The new formula is $v = 124 \cdot 3 \sqrt{r^2 s}$, and it will be noticed that only one co-efficient for all sizes of channels, if of good brick work or cast-iron, is employed. This formula was tested by remarking the flow in a brick channel of one of the London sewers, in which the conditions admitted of careful observations being made, and it was shown to give very trustworthy results, erring, if at all, on the side of safety. Since it possesses the advantage of needing but one co-efficient for all sizes of channel, it is preferable for everyday use to expressions of a more complex character.

MR. MERRILL, in a paper read before the Fire Underwriters' Association at Chicago, has given some interesting statistics about the fires in the United States which were caused by the use of electricity. From the records of nearly one thousand such fires, it seems that they cost the insurance offices nearly 5,000,000 dollars annually. Only fires which were clearly of electrical origin are considered, and few large fires are included in these records, as large fires generally destroy all evidence of their origin. The most frequent cause of this kind of fire are the trolley wires used for electric traction. These wires, which carry current at a high pressure, and from the nature of the trolley system uninsulated, hence any telegraph or telephone wire coming in contact with them may cause tremendous damage. For instance, one of the fires was caused by the trolley-pole raising the trolley-wire high, so that it came into contact with a telephone wire, the consequence being the immediate destruction of the telephone switchboard, and over half the telephone connected with the exchange. Many other "burn-outs" happened during snow-storms when the telegraph-wires were broken and weighed down, so that they touched the trolley-wire. In one town alone, during a snow-storm which lasted for only a few hours, ten horses were killed and hundreds of telegraph, telephone, and fire-alarm instruments were destroyed. For these reasons, Mr. Merrill strongly urged every underwriter never to miss an opportunity of opposing overhead electrical work, and pointing out the advantages of having the wires underground. He stated that in most towns it was easy to start an opposition to over-

work, and that it was for the ultimate of all parties concerned. In country districts, where the expense would be prohibitive, stringent precautions must be employed, guard-wires being affixed to the wires in all cases, and protective devices used. Next in point of danger to the electrician is the defective fittings, especially the cut-outs, ceiling-roses, &c., which are often bases; happily these are now very common in this country. Sparks from arc-lamps coming into contact with gas or oil-pipes have also caused fires. One of the most serious accidents of the year is due to the heat of an incandescent lamp, which is worth mentioning. A visitor at a friend's house failed to understand how the electric light in his bedroom was turned out. After various expedients, as a last resort he pulled a towel round it. During the time the towel smouldered and caught fire, the visitor having a narrow escape, for when he was rescued by the firemen he was in an unconscious condition.

The second of the course of lectures on building and sanitary construction being given at the Carpenters' Hall, on Wall, was delivered on Wednesday by Professor H. Robinson, M.Inst.C.E. The subject of the lecture was "Sanitary Appliances," but the Professor dealt only with the removal of foul matter from a house by the water-carriage system, and in the course of a very instructive and able address referred to that much-debated question of proper flush for a water-closet. The lecturer mentioned that the effect of a flush depends very largely upon the construction of the closet, and that in some cases a two-gallon flush was sufficient; but he added he preferred a three gallon for all forms of closets. He also stated that at the present time an inquiry is being held by the Government Board on the subject of experiments carried out by the Sanitary Committee some time ago were, in some cases, very startling and appeared to be decisive, and it is not surprising that it is recommended that a *minimum* of three gallons should be fixed, with a maximum of five gallons. It is not only the cleansing of the water-closet basin and trap that is to be looked after, but also the cleansing of the house and the proper carriage of water to the water-closet; and in view of the report of the Royal Institute and of expert opinion generally we shall be surprised if the result of the present inquiry does not effect an amendment in the law on the subject.

An exhibition at Messrs. Tooth & Sons' galleries in the Haymarket is worth a visit if it were only to see again Mr. Gordon's fine picture, "An Enigma," which some of our readers may remember at the Royal Academy three or four years ago. The colour, composition, finish of detail, and the suggestive quality, it is one of the best of the painter's works, and is like a picture compressed into a single scene. The picture of special interest is an early rather early work by Mr. H. W. Lewis, "On the French Coast" (43), in a style from his present work, and with a quantity of beautifully painted foreground. Among other works of interest are Mr. Alda's "Invading the Sanctuary," a tiger leaping into a Hindu temple, Sir F. Ton's "Sybil," Miss Clara Montalba's picture of St. Mark's exhibited some time ago at the Academy, M. Bouguereau's "Bather," a fine half-length figure-study in a usual finished academic style, Mr. Gordon's "A Highland Sheepfold" &c. In a small room a collection of architectural drawings, chiefly of Venice, by M. F. del Rio, though very hard in effect, are remarkable for their brilliant realism, and would be of interest to architects.

Berlin architect, Herr Schwächter, has perpetrated a most extraordinary unheeded freak of vulgarity in connection with a new building of which he is

architect, the Emperor William Memorial Church, which was opened in September. On one of the bas-reliefs in the interior the following sentence was, under the architect's orders, chiselled on the stone—"What camels we have in the City Fathers of our capital: 2, 5, 1895; not even 15,000; how mean." The words refer to the fact that the Municipality had been asked to contribute to the building of the towers, and had politely declined to apply the ratepayers' money for that purpose. On finding that the local authorities and the respectable portion of the Press were very indignant at this most indecorous proceeding, the architect averred that it was "a joke." After much delay the words were obliterated under his supervision, but not till after the inauguration. It is to be hoped that the Berlin Architectural Society will do something to mark its opinion of the perpetrator of such a piece of vulgar insolence; but the author of it is an architect holding an important official position, and as such is protected by the aegis of Prussian officialdom. As a piece of bad taste, the action seems almost unique in the history of the architectural profession.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

PRESIDENT'S ADDRESS.

THE opening meeting of this Institute for the present session was held on Monday last, at 9, Conduit-street, Mr. F. C. Penrose, F.R.S. (President), in the chair.

The President, who was received with applause, delivered the following address:—

Since the delivery of my first Address from this Chair, just a year ago, we have recorded the loss by death of no fewer than seventeen Fellows, all men who have made some mark in the profession, while a few were highly distinguished—personal friends of long standing to many here and to myself. Ewan Christian, a predecessor of mine in the Chair of the Institute, had been a member fifty-five years, ten of which he passed as Associate. My friend St. Aubyn, who spent the last years of his life at Marazion, in sight of the famous St. Michael's Mount with which his family name was connected, was elected an Associate three years earlier, in 1837; and Henry Clutton, whom we have known as the Clutton of Hartwood, became an Associate in 1838. These three men, who have now joined the majority, may be said to have been identified with the Institute during the whole course of its corporate existence; and, certainly, we could wish for no worthier representatives than they showed themselves during that relatively long period. There is one other name I would mention, that of Paley, whose residence at Lancaster prevented his many friends in London from meeting him as often as they desired. We have also lost two of our Examiners, Ernest Turner and Harry Drinkwater, both of whom devoted themselves to the work—by no means light or easy—which devolves upon those members of the Board who set the papers and conduct the Examinations qualifying for candidature as Associate.

We have also to deplore the decease of seven Associates, one of whom, Gordon M. Hills, elected in 1853, was an archaeologist of repute; while to another, Herbert Gribble, is due that important work of architecture, the Oratory at Brompton. From among the Hon. Associates, Alfred White, who had been a member from the foundation of the class, and who will be remembered as having at an earlier period taken an active part in the work of the Society of Antiquaries, is gone.

Dr. Reichensperger, of Cologne, who had been thirty-one years a Corresponding Member, and Richard Morris Hunt, of New York, who was the first citizen of the United States to receive the Royal Gold Medal, are both lost to us; and to lose men of the kind is a far greater loss than many of us, in the hurry of life, are perhaps aware of, for, among our half-hundred of Correspondents, none were more friendly to this country and to British Architects than they were. Reichensperger, from his place in the German Parliament, invariably held up to notice and praised our free English custom and methods in architecture and the arts: he was an enthusiastic Goth, if I may be permitted the expression, and was one of the Jury in the great international

competition for Lille Cathedral, high place in which was awarded to Englishmen. Hunt's speech in acknowledgment of the Queen's gift, made in this room little more than two years ago, is still fresh in our memory; and I may take this opportunity of stating that in the choice the Institute then made of Hunt as the representative architect of the United States, we chose the very man whom his architect fellow citizens would have chosen had they been asked, and whom they delighted to honour and see honoured.

I hope that the time spent over the mournful prologue with which I have been compelled to open my remarks will not be considered excessive, for I have much to say, which may be divided under two main heads: (1) The treatment of architects by the public, and, (2) The relations and services of the Institute to the profession and the public. Before, however, proceeding with these principal points of my address, I wish to be allowed to glance briefly at some of the events of the last twelve months which concern ourselves and our work.

With the current year there came into force a new Building Act for London, and a Tribunal of Appeal to which contested questions under the Act are submitted; and I venture to see in the establishment of the Tribunal the germ of powers very much higher and more extended than those yet accorded to the new Council of Three. One of my predecessors in this Chair, Mr. Waterhouse, said in 1889, just six years ago, that "A special Tribunal for the consideration and settlement of building cases" was required; and if we have not obtained quite all that he then wanted, we have at least the beginning of it. The current year also witnessed at its commencement an important development in our Examination system. From January 1, 1895, every fresh applicant for admission to the class of Associates has to ascend three stages of progression before he can pass as qualified for candidature. He has first to be admitted a probationer, then a student, then a candidate; and this requires a minimum period of five years to accomplish. True, there are special facilities for architects in practice and chief assistants to enter for the single final examination, but, for all youths entering the profession, the three grades must be successfully attained before an applicant can submit himself for election as Associate. The current year has also witnessed a revival of the Architects' Registration Bill, which was read a first time in the House of Commons that has recently passed away. Its attempted passage through Parliament was opposed by the Royal Institute of British Architects, involving an expenditure of labour and of money which the Institute is ill prepared to meet, and we were ably assisted in our opposition by the Architectural Association and the Art-Workers' Guild; but none of the Royal Academies of Art in the United Kingdom spent a farthing in defence of their architect-members menaced by the provisions of the Bill.

Early in January we were enabled, through the courtesy of the French Government and the kindness of the Institut de France—the attainment of whose centenary this year is an event of high importance, not only to Europe, but to the world at large, and one which evokes our heartiest congratulations—to exhibit a remarkable series of drawings of the Pantheon, the work of Monsieur Chedanne, Grand Prix de Rome. Later in the year it was our good fortune to welcome a large number of architects and engineers from Cologne and the Lower Rhine, who paid a week's visit to London. Both these events possess a value to us, as professional men, distinct from the purposes they may be said to serve, for they initiate association and establish ties between the architects of different countries, few, if any, of whom should be better acquainted with each other or respect each other more than those of Germany, France, and England.

Some effort also has been made during the last few months to arrange a scheme for the utilisation of our loan collection of educational books by members resident at a distance from London and by the allied societies. A catalogue of this collection has been published in the "Kalendar" issued to members last week, with the object partly of showing them how the collection is composed, and partly of inducing them to offer suggestions for its improvement, or even to contribute additional copies of works in constant demand by probationers and students. A Report on the subject will be submitted, I believe, in due course; and meanwhile I content myself with urging you to look carefully at the catalogue to which I refer, and to give the matter your serious consideration.

Architects and the Public: Restricted Employment of the Architect.

The more usual course on these occasions is for the President to address his brother architects, looking chiefly at their position with reference to their employers, the public—by this word meaning either private employers, public bodies, or associated committees. It may not, however, be disadvantageous for once in a way to look at the matter from a somewhat different point of view, and to consider what architects have a right to expect from the public, and especially in the case of public competitions, which are often very unsatisfactory, and to which I shall refer some length further on.

There seems to be an impression abroad, and one which is very unfavourable to our profession, that the services of an architect are not required unless a building is to be of an ornamental character, and that when an architect is called in it must necessarily be more costly than in those cases where he can be dispensed with. We all know that that is a great mistake; but it would be mutually advantageous to the public and ourselves if it were realised that the well-ordered plan elaborated by a skilful architect must necessarily be economical in many ways, and if some initial expense has to be incurred by his insisting on sufficient solidity and good material, it is very soon recouped, and over and over again saved in the repair bill. If the employer asks for a building without ornament, the true architect will make no objection: he will know how to produce a good and comely, or even stately, building without it.

One of the greatest satisfactions that an architect can feel is when the ultimate cost of a building is kept very closely to the first estimates. When this has not happened it may very frequently be traced to a want of proper confidence shown to the architect at the outset. The employer supposes that it will promote economy if he names at first a smaller amount than he is prepared to spend. To this the architect adapts his design, and the work is commenced; but as it proceeds the employer, or perhaps his wife, demands additional size or other modifications which can only be introduced at a greater cost than would have been the case if they could have been embodied in the original design. Something of this kind can also have arisen from the work having been commenced in too great a hurry by the urgency of the employer, owing to his ignorance of the time required for the due elaboration of the design. For, however long he may have been himself deliberating on the undertaking, almost as soon as the architect has been consulted the contract drawings are expected to be ready, and the work put in hand, before the plans have been maturely discussed between the employer and the architect. Much time and much subsequent worry might frequently have been avoided by a few weeks', or even days', free intercommunication before the design was put into execution.

We are all of us, however, I feel sure, familiar with cases where due consideration has been shown by the employer to the architect; but I have no occasion to enlarge upon these.

Building Surveyors under Local Authorities.

In communications between architects and the District Surveyors in London the latter are found almost invariably just and courteous; but I am informed that in many provincial centres the local Acts and by-laws (which had not during their formation the advantage which the London Building Act had, arising from the great pains which some of our members took in discussions with the London County Council, obtaining thereby important amendments) are administered under surveyors who have often had no architectural training whatever. Architects who may be practising in those places are frequently much harassed, and interfered with in an unwarrantable manner, even to the extent of the builder being ordered to alter parts of the work without any reference to the architect. According to the information I have received, public or municipal buildings seem to offer the most frequent occasions for interference with the legitimate position of architects.

Our brethren of the allied societies may feel assured that if there are any points connected with this matter on which they think the Institute can aid them, the Council will be very glad to receive communications on the subject.

Competitions in General.

The most unsatisfactory relationships between architects and their employers are apt to arise in the arrangements connected with architectural competitions. That the competing architects are not unfrequently themselves to blame for part of

this has often, and not unjustly, been said both in this room and elsewhere; but much of it is caused by the promoters of competitions, who ought to consider more than they are apt to do what is due to the profession. This is, no doubt, often the result of ignorance on their part, and, if so, there is hope that it may be gradually improved. It is already a favourable sign that in very many recent competitions professional assessors have been appointed, but, but there has been in too many instances a want of proper consideration shown to the assessor's award.

On the subject of architectural competitions in general my immediate predecessor in this chair contributed a paper to the "Journal" in April, 1891, the arguments of which appear to me very hard to meet, showing that the principle of these competitions is altogether wrong, and beneficial neither to architects nor to the public. This statement, however, with respect to the former, perfectly true as it is, as I hope presently to show, may not be quite so convincing to all of us as to the public: because, whether rightly or wrongly, young aspiring architects probably do think that from competitions, whether they are successful or not, they get an opportunity of advertising their powers. But as regards the public, it appears to me that Mr. Macvicar Anderson's argument in the paper referred to is solid all round, namely, that a competition is not the way to get the best architectural result. It can hardly ever happen that any set of conditions and instructions issued by a committee can supply competing architects with all the information required for forming a successful plan at all comparable to the free intercourse of an appointed architect with his employers at the outset. At any rate, whenever a competitor has obtained such full information it must have been by means not equally accessible to other competitors, and therefore unfair to them; and there is little probability of a design based on such data being the best which would have been possible if all had been as fully instructed. Let us, however, suppose there has been no unfair running, that the architect has been appointed who has gained the award, and that he is really the most skilful of the number. When he becomes more fully acquainted with the circumstances of the problem he will almost certainly find that material alterations from the competition design ought to be made, and probably will have to be made; in which case it can hardly be otherwise than that he will be much biased by the first design, and he would have produced a much better building if he had been appointed without a previous competition.

It seems to me quite clear that an architect's best work cannot be brought out by competition as we generally understand the word. He must, so to speak, be serving two masters—one that which is best in the abstract, and the other that which is most likely to please the promoters who often are very incompetent persons. It may be said by some that the spur of competition is useful in exciting genius; but a far healthier stimulant is the wish that a building which may have been entrusted to his hands shall redound to his credit. This is the true and only competition which ought to be encouraged.

Competitions and Competitors.

Then as to the bearing of the question with respect to our profession, my attention has been drawn by a friend to the case of a recent competition, that, namely, at West Ham.

"Here," he writes, "seventy-five designs were sent in for a building to cost £40,000. One man would get properly remunerated, two others get small inadequate premiums, and the remaining seventy-two will have lost all the time and money spent. At the ordinary professional charge for sketches only, viz., 1 per cent., the amount would have been £400 for each of the designs, so that at this rate the cost of professional labour has been nearly three-fourths of the cost of erecting the building. Surely this must be a great loss to the profession as a whole, and the great majority of the competitors might have been better employed and more profitably. Business men have frequently expressed the utmost astonishment at this wasteful system."

Another point which ought to be considered as exercising a very unfavourable effect upon architects who engage in competitions is the severe mental strain to which even a successful competitor must be subjected in compressing his work into too short a space of time. There is nothing in other liberal professions at all analogous to our architectural competitions, and they certainly do not raise architects in public estimation, particularly in the way in which they are so often conducted now. The practice has

become so general that I cannot flatter myself to be arrested; but it may be improved. My excellent address recently given at Manchester, Mr. Holden, the President of our A.S. Society, in referring to this very subject, put out the most effectual means, and concluded thus:—"The question is a very difficult one to deal with, especially so long as architects position can be found ready and willing to enter into competitions on almost any terms. Leading architects would refuse to compete on fair and proper conditions, there may be some chance of obtaining better conditions but until this is done I really cannot see any out of the difficulty."

Instead of resorting to competition, a far better plan for promoters would be to discuss among themselves and settle who the architect should be for any particular work. Committee promoters who think they are securing for subscribers whom they represent the best result by eliciting, as they seem to expect, inspirations from a number of different minds and choosing the best of them—which means follows as a matter of course—go a wrong way to work. Again, if there be occasions when competitions are more undesirable than others, it is in cases where adaptations to be made to existing buildings.

I have thought it right thus to affirm my agreement with my predecessor in his view of the subject of competitions in general, in the hope that in some, however few, occasions it will be taken into consideration by promoters. I have to discuss some points in connection with the system already become so fashionable, and will be applicable both to open competitions to those that may be restricted to a limited number, looking at the matter as much as possible from outside the profession. One observation would first make to competitors, and that is to urge them to take the advice given from this by Mr. Waterhouse in his address to Students in 1889, namely, that when unfair or obviously leading conditions of competition are issued by a promoter, the duty owed to the profession is to make no response. In short, Answer him not.

Competitions and their Promoters.

Unfair conditions are not always—indeed should rather say are not generally—the outcome of unfair or ungenerous feeling on the part of promoters; for their often objectionable competing architects are much to be blamed. At various times architects have complained they ought to have declined, and thus promoters to think that they will get a sufficient response under almost any circumstances. An example of the kind, embodied in an invitation to architects, accompanied by a proposed set of conditions, from which I select the clauses that bear upon the subject before us, has come to me, which, however, seems to be but a specimen of a class; but it is a class which I think will yield to improvement if architects will but make a proper stand against anything of the kind refusing to compete. It will be observed that these the authority of the assessor is reduced to the lowest possible degree. This was a condition for designs for enlarging existing buildings and the conditions were virtually as follows:

- (1) The committee have appointed Mr. _____ to act as assessor to assist them in their selection.
- (2) Block plan of present buildings can be seen at _____.
- (3) Drawings required.
 - (a) Block plan, with position of buildings, roads, drainage, &c. in. to the foot.
 - (b) Plans of each floor.
 - (c) Elevations and sections, 1 in. to the foot.
 - (d) Plan of suggested alterations, accompanied by same for connexion and communication with proposed new buildings, and improvements of sanitary arrangements.
- (4) Each to be accompanied by a complete specification and description of means of heating, ventilating, and draining.
- (5) Any design will be excluded which is not the opinion of the committee and the assessor does not conform to—
 - (a) If sent in after date mentioned.
 - (b) If it does not give the accommodation required.
 - (c) If the committee and assessor should judge that the probable cost of carrying out would exceed the limit allowed.
- (6) The committee will award a premium of [namely, a sum not quite amounting to £100, pound, reckoned by the limit of expenditure in the conditions], subject to rule (5), to the architect of the plans considered the most suitable; and such premiums being paid the plans shall be the absolute property of the committee.
- (7) Should the committee employ the architect

ceiving the premium to carry out his designs (with or without modification), such premium to merge in the commission.

(8) Accommodation required [a long list of desiderata].

(9) Committee reserve right to appoint quantity surveyor.

(10) The limit of expenditure.

(11) After award plans of unsuccessful competitors to be returned, carriage paid, but the committee will not be responsible for any loss or damage.

No lengthy comment is needed on the above. The committee under these conditions, by a majority of one, might, in consideration of the premium offered in Clause 6, impound the plans and put them in the hands of a clerk of works to execute.

In commenting in the *Builder* of the 17th ult. on a recent competition, the Editor calls attention to the absurdity of a somewhat favourite condition used by promoters—viz., that the designs are to be accompanied by a tender from a responsible builder. How could a *bona-fide* tender be given unless the quantities were taken out? And we all know what a long operation that is—absolutely consistent with the circumstances of a competition. And then follows a condition which ought to have warned any reasonable-minded architect off the field—viz., that the committee reserve the right to retain and carry out at their own pleasure all or any parts of the premiated designs without any reference to the architect.

Surely in vain the net is spread in the sight of my bird, said the wisest of men—but he evidently did not reckon for an architectural competition. I am glad, however, to be able to bring before you another case, of which the preliminary proposals have lately been issued, and from which I extract some clauses forming an agreeable contrast with the last:—

(1.) The President of the R.I.B.A. to nominate an assessor.

(2.) The assessor shall draw up the conditions of the competition, and in giving his award shall state writing his reasons for doing so. All the competition designs shall, with the consent of their authors, be publicly exhibited after the award has been given.

(3.) The design awarded the first place by the assessor shall be the design adopted unless it should be found that a majority of not less than three-fourths of the entire committee are in favour of any other of the competing designs, which in the latter case all be adopted.

We are all, I believe, convinced that no response ought to be made to an invitation issued in any competition unless there be a professional assessor appointed; and it is self-evident that such assessor ought to be a man of high standing, and free from any local interest. But, with this exception, rather different views appear to be held respecting the degree of authority with which ought to be invested in regard to the appointment of the architect to carry out the works after he has given his award. There is one thing, however, of extreme importance, namely, that should not be called in, as is too often the case, upon a number of designs have been sent in in answer to the unassisted invitation of the promoters, but that he should himself take the leading part in the preparation of the conditions and instructions. When this is done promoters may be saved from making many mistakes. A very misleading error they often make is to give a statement of their desiderata, and proceed to state a limit of cost, which are frequently quite incompatible with each other. Hence arises a sense of very great perplexity both to the committee appointed; and to an assessor appointed after the designs have been sent in, the latter finding it impossible to adjust the two irreconcilable views. Here, however, an objection of some weight, though not comparable with the absence of professional direction, in the drawing up of conditions, that if the assessor is known beforehand—it is hardly possible that in his conferences with the committee of promoters he could remain *incognito*—the competitors will be more or less influenced in their designs by the knowledge of his known or supposed architectural bias; and this is perhaps the reason why the assessor is so often being only called in at the last moment, when all the mischief introduced by needless and misleading rules has been done. It is, however, a difficulty, which, when thought of with anxious consequence, could be avoided by means obvious to those who have experience in such matters.

Returning to the question as to the amount of authority which ought to be given to an assessor, it certainly appears to me that he should not be merely allowed to recommend a certain course of action to the committee of promoters, but that his

position should be made predominant. As, however, the promoters can hardly be expected entirely to give up their control of the decision, I gladly endorse, as the course which meets the view I had myself already formed upon it, the condition I have already quoted, that the assessor shall have the duty of nominating the architect, unless his selection shall be challenged by three-quarters of the whole committee; and I think that such a clause as this would satisfy our expectations, which several recent repudiations of the assessor's award have seriously disappointed. It has been suggested that the assessor's award should carry the appointment absolutely, unless some valid reason be forthcoming to the contrary, and that such validity should be decided by appeal to the President of the Institute. But it appears to me that promoters would be more likely to agree to the former rule, which would in almost every case exclude local favouritism.

The course which appears to me to be the most desirable, and which I am glad to find coincides with the opinion of several highly experienced assessors, forms one of the suggestions printed in our "Kalendar," namely:—"That the promoters should by advertisement invite architects willing to compete for the intended work to send in their names by a given day, with such other information as the candidate may think likely to advance his claim to be admitted to the competition. From these names the promoters, with the advice of the assessor or assessors, should select (a) [and this I hold to be the better course] "an architect to carry out the work, or (b) a limited number to compete, and each competitor thus selected should receive a specified sum for the preparation of his design. The author of the design awarded in the first place should be employed to carry out the work"—and to this might be added a very desirable suggestion, that some proper remuneration should be given to the architect selected if the work should not be carried out under his superintendence within some reasonable time.

The Institute, the Profession, and the Public: The Development of Architectural Education.

In the extremely able address that my friend, Mr. T. G. Jackson, A.R.A. (a name to which I greatly regret I cannot add the letters F.R.I.B.A.), gave at the opening of the Liverpool School of Architecture, and which has been printed in the "Journal," he says that throughout the land technical schools and institutes are rising. Nothing, indeed, can serve to encourage those who have laboured in the cause of education for architects and handicraftsmen more than the foundation of the Liverpool School, under the combined auspices of that city and of Victoria University; and I see no reason why, after efforts similar to those which have resulted in success at Liverpool, other important cities in the United Kingdom, such as Edinburgh, Dublin, Manchester, Bristol, Oxford, and Cambridge, should not found or develop a like school, and a like Professional Chair of Architecture. I do not mention Glasgow because a Chair of Architecture is already in existence there. The Institute may well be proud of the remark made by Mr. Jackson above referred to, for the initiation of this gratifying development of architectural education, which is to be witnessed throughout the United Kingdom, is mainly due to us.

Let us go back together for a few years, even less than twenty years, and ask ourselves whether we are any the worse now for the change, if any, which has come over our art from this still-vexed matter of education; or, indeed, whether any change whatever has taken place which may be deemed detrimental to our art? What security had we, in the year 1875, that the young men whom we elected Associates of our body had received any, even the most superficial education, scholastic or technical; or that they were fitted, by nature and position, to exercise the functions of an architect? How was an outsider then to know, except by personal trial, whether any Associate R.I.B.A., whose reputation was not established, had or had not received any education in the art, science, business of architecture? All that we required in those days from a candidate for the Associateship was his nomination by three Fellows who knew him, and his ability to pay an entrance-fee and an annual subscription; with his acceptance of honourable obligations such as are now in vogue. Twenty years ago we were pointedly asked in this room by a visitor, What evidence was there that any man setting up as an architect had the smallest scientific knowledge, or even a knowledge of mechanics, or of the qualities of different materials, or in short of anything at all except the power of making a sketch which might

satisfy ignorant employers, and plans and elevations from which builders would never hesitate to contract? The question was left unanswered at the time, and a year ago or so afterward, when we re-arranged our by-laws, one was added to the effect that after May, 1882, no one should be admitted to the class of Associates until he had undergone the test of a professional examination. At that time the Council were strengthened by the inclusion of most of the Past Presidents and Past Vice-Presidents, who gave not only advice but a great deal of assistance in the work of re-organisation; and I should be unjust to the memory of an able colleague, who occupied this chair with advantage to the Institute, were I to omit mention of the late Mr. Whichcote, whose energy and business capacities largely contributed to its success. Nor can I forget that the late George Edmund Street presided over, and took an active part in the work which preceded the first obligatory examination held in March, 1882. The results of the subsequent thirteen years are visible in the establishment and development of schools, of studios, of classes of architecture, and the subsidiary sciences and arts.

One of our earliest efforts was to publish, in 1870, a list of books, which the Council recommended to professional students; and a revised list, slightly modified in form, was published in the "Journal of Proceedings" of 1882-83. This afterwards appeared in the first issue of the "Kalendar" in 1885, and in a revised form has been annually published therein. About the same period communications were addressed on this subject to the chief provincial centres, and we were soon gratified to learn that some of the free public libraries, notably those of Liverpool and Manchester, had acquired the books thus recommended, and that students in those centres preparing for our examination could find there, ready to hand, some, at least, of the means of education. In 1887 one of my predecessors in this chair, the late Mr. L'Anson, addressed a letter to each Fellow and Associate, calling attention to the views he had expressed in his Presidential Address of that year on the subject of education generally, and stating that the future prosperity and influence of the Institute, and its position as a representative body must depend on the continued and increasing accession of the younger members to the class of Associates. He therefore urged that the direct personal influence of the elder members was necessary to guide the studies of their pupils, and assist them towards successfully undergoing the test of examination. The personal response given to this appeal at the time was most gratifying, and the results are even more so; for in October, 1887, the Associates numbered 681, of whom 122 had passed an examination prior to election, while at the present moment in November, 1895—only eight years later—they number 924, of whom 577 have entered after examination. There are, moreover, on our registers 142 students and 703 probationers, most of whom, in due course and in regular progression, will seek admission to the class of Associates.

Not the least potent factor in the spread and development of education has been the alliance of non-Metropolitan societies with the Institute. The main objects of this federation, which were stated at a meeting of the General Conference of Architects held in this room in May, 1887, were educational; and they were practically agreed to in the following March, the whole being confirmed in by-laws made under the provisions of the New Charter of 1887, and approved by the Privy Council in February, 1889. Nine societies were almost immediately taken into alliance, and at the present time they number fifteen at home and one in Australia. In 1893 a conference of these allied societies, then thirteen in number, was held at the University in Liverpool for the purpose of discussing a proposal to divide the United Kingdom into districts, of which the local societies then or hereafter allied to the Institute would be the respective centres. Among the results of the Conference which approved the proposal was a collective opinion, stated in the form of a resolution, that the establishment of such districts, each with its local allied centre, would enable arrangements to be made for extending throughout the country the advantages of our examinations, and promote a systematic organisation for educational purposes by utilising and developing the means of instruction available at or connected with such centres; and I am bound to add that the opinion then formed was far-seeing and correct.

Gentlemen, let me beg you to look into our

"Kalendar" for the Sessional year of 1892-93, in which the local "educational facilities" at each allied centre were given for the first time, and compare them with similar particulars in the "Kalendar" which has just reached your hands. This will assure you of the success that has attended the federation of the chief architectural bodies in the United Kingdom, as well as of the favourable influence that the establishment of an obligatory test, in 1882, has had on the education of architectural aspirants. Only three years ago, of the thirteen allied societies only that of Manchester possessed a lecturer in architecture, namely, Mr. Steffox, the Ashpitel Prizeman of 1888, who conducted classes held by the Society on Monday evenings. That of Liverpool had a sketching club, and also classes of design and construction, with a special course of instruction, which, from the subjects it included, may be said to have been based on the programme of our examinations, and each subject was entrusted to a member of the Society who acted as lecturer and visitor. That of Birmingham had a class of construction held at Mr. Lloyd's office, and a class of design held at Mr. Hale's office, at both of which members of the Birmingham Association attended as visitors. That of Sheffield had classes for the study of specific subjects. The Societies at Leicester, Glasgow, Newcastle, Bristol, Nottingham, Dublin, Leeds, Exeter, Dundee, in 1893, had no educational courses of instruction; and, except in Glasgow, which possessed Mr. Gourlay, and Leeds, which possessed Mr. Howdill, there were no outside instructors in the various technical schools situated in those towns, nor had those institutions any course of instruction to which young men, hoping to become architects, could apply themselves with confidence.

But the progress which two years alone have wrought is remarkable. In our "Kalendar" recently issued it will be seen that every allied centre now possesses local educational facilities of some kind more or less complete, for architectural pupils. At Sheffield the Allied Society is connected with the School of Art, and at the technical school in that centre a course of instruction,* both elementary and advanced, is given. In Leicester the School of Art affords similar instruction, but as yet it has no professional instructor. In Manchester excellent opportunities are offered at the Municipal Technical School for instruction intended expressly for architects' pupils, improvers, and assistants preparing for our intermediate and final examinations; and at the Municipal School of Art in that city, the teaching staff of which includes Mr. Walter Crane;† while in the Manchester district there are classes of a similar character at Accrington, Bury, Blackburn, and Todmorden. In Glasgow the School of Art, with which the Glasgow Institute is closely identified, has courses of study arranged to include the subjects required for our intermediate and final examinations, with lectures on "Domestic Architecture" and "Design."‡ At the same allied centre the Glasgow and West of Scotland Technical College has organised some most complete courses of instruction under the direction of Professor Gourlay, and established a studio in which instruction is given by Mr. Lochhead, all of which have been fully described in our "Journal." In Newcastle-upon-Tyne three different institutions provide more or less instruction for architects' pupils. In Bristol the University College has a special educational course, adapted to architectural students. At Liverpool, the School of Architecture and Applied Arts, already referred to, and of which a full description is given in our "Journal," bids fair to make its scheme of instruction valuable and successful. At Birmingham a four years' course§ has been instituted; and at Leeds instruction is given both at the School of Art and the School of Science and Technology. At Dundee there are two educational centres for young men preparing for our examinations. In Dublin, lectures are given, adapted to architects' pupils, at the Metropolitan School of Art,¶ at the Royal College of Science, and the Technical School; and at Nottingham, Exeter, York, and Cardiff there are local educational facilities in a more or less advanced stage of organisation. In the greater number of the

above cases the lecturers are members of the Royal Institute of British Architects.

In fine, there are now chairs of architecture in Glasgow and Liverpool; and there are schools in which the elements of architecture are taught, forming or formed in most, if not all, of the districts into which we have divided the United Kingdom. Less than ten years ago hardly anything of the kind existed outside the Metropolis; and I who have taken only a very subordinate part in the work which has led to such satisfactory results venture to offer to those gentlemen who have mainly contributed to it my hearty congratulations.

The consistent course of study which for several years is looked for from those who undertake the very responsible business-habits and the literary and artistic knowledge involved in the practice of architecture, can hardly fail to have the effect of giving assurance to employers that in selecting an architect who has passed the ordeal they cannot be dealing with a charlatan. When regarded from the point of view of an aspirant or his parents, it is not denied that the required curriculum is intended to deter those whose abilities or capacity for hard work, which has been well defined as genius, do not lie in the direction of architecture; but to those who are not so disqualified it may prove a sufficient encouragement that many others, to whom they have no need to consider themselves inferior, have succeeded in passing the examinations.

Connected with this subject, there arises one point worthy of our consideration, and to which I feel I ought to refer—namely, the fact that the examinations are conducted by volunteers from amongst our numbers. It will not be thought surprising that this makes a considerable difficulty in keeping up the rota of examiners able and willing to undertake the work. Greatly indeed is the Institute indebted to those who have hitherto volunteered and still continue to do so; but it would facilitate the progress of the examinations very considerably if reasonable fees could be found for the examiners. The obstacle to this course lies mainly in the emptiness of the Institute's treasury, on which subject we lately had some important remarks from our auditors at the June business meeting. This emptiness of the treasury is engaging much attention from the council, and will not be lost sight of during its coming deliberations. I certainly feel that, should a sufficient improvement be the result, a moderate honorarium to the examiners would form a fitting application of part of it.

The Metric System of Measurement.

There is a matter very seriously affecting us whose daily duties lie with *pondere, numero, et mensura*, to which I think it may not be out of place for me to refer here. Not long since the Parliamentary Committee appointed to consider the national standards, &c., reported in favour of our adoption of the metric system. The change would no doubt introduce certain and far from unmixt advantages, but it would be attended with enormous trouble not to be got over for many years. I venture to take this opportunity of bringing before this body—than which no other in the kingdom could be so well or practically able to appreciate it, and to which it would come home so intimately—an alternative which I cannot but think to be worthy of your consideration, in the hope that, if it should be well received here, some course founded upon similar ideas might make its way with the public. Instead of swallowing the metric system as a whole, what I here venture to recommend would, unless I greatly deceive myself, give to our commercial classes all that they could properly ask for, and to ourselves and the millions of the industrial classes all the advantages which could arise from the metric system, with less than one-tenth of the disturbance. The scheme involves a very insignificant change in our own reckonings of length, weight, and capacity to render the English standards easily commensurable with the French. I shall confine myself in what I say this evening to the measurements of length, as it is in these, it seems to me, that the change to the metric system is most to be deprecated; and suggest an alternative course by which we could obtain all the advantages of decimal notation without having to be saddled with the unwieldy metre—a standard that has to be used fractionally in 999 cases out of the thousand which occur in daily use.

If our inch were reduced in length by about one hair's breadth, ten such inches would be twenty-five centimetres, a measure which is current in Italy, the palmo having been altered so as to agree with the quarter of the metre. I

would, therefore, recommend the word *palm* to be used to denote a length of ten such inches, thus serving for general use instead of the foot, and giving us at the same time a decimal notation, whilst all small dimensions could be reckoned, as now, in inches, halves, quarters, and eighths, or decimals of the inch at pleasure. In our dealings with those nations that have adopted the metre, it would be only necessary to multiply or divide by four, as the case might be; that is, divide a measurement given in metres and centimetres by four, to bring it to English palms and inches, or multiply English palms and inches by four, to bring them to the metrical scale. The slight alteration in the inch would not be felt in the dealing of our poorer classes, who are really the persons, both numerically and morally, to be most considered, and the complication introduced in commercial transactions would be very slight. Scientific calculators could readily take care of themselves. Weights and measures of capacity could be dealt with in an analogous manner by an almost insensible alteration of the ounce or the pound, the pint or the gallon, though the necessity in these, perhaps, would not be so great, because the kilogramme and litre are more reasonable standards than the metre. The above is the broad outline of the scheme which I venture to bring before you, and it is not fitting that I should carry it any farther this evening. I can hardly think that the proposal has not been made by any other person, but I have not taken it from anybody else. I am not advocating change, though I confess to leaning towards decimal subdivision and to a desire for greater uniformity and simplicity, especially in our measures of capacity; but if a change is to come, I trust it will not be by the metric system adopted *en bloc*.

The Class of Fellows: an Appeal and a Suggestion.

I began my perhaps too lengthy Address by reference to the sad losses we had sustained in the ranks of members, and I propose now to conclude with some comments on the accession made during the past twelve months, amounting to 5 Fellows, 67 Associates, 3 Hon. Associates, and 8 Hon. Corresponding Members. But, as a matter of fact, the class of Fellows has lost, not gained, strength. The Fellows, who last November numbered 617, at the present hour number 596, being a diminution of 21. The Associates who a year ago were 872 in number, have, on the contrary, advanced to 924, being an increase of 52. In the course of the year only 4 out of the 872 have become Fellows. One gentleman who applied, and who had never been an Associate was elected a Fellow at the final Business Meeting of the past Session. I have also ascertained that during the last two years (1893-94 and 1894-95) only four outsiders, if I may be allowed, so to designate men previously outside our ranks, have been admitted to the class of Fellows, though during the two previous years fifty-six outsiders were admitted; during the two years before fifty outsiders were admitted; and during the antecedent two years (1887-88 and 1888-89) sixty-nine outsiders were admitted to the class of Fellows. These outsiders, as I venture to term them, were architects in the provinces, at foreign stations, in Australia and the Colonies, with a few Londoners—men who had had little, if any opportunity when young of becoming Associates. If you will glance through the published list you will find that they constitute an additional strength to the Institute, and in many instances have added lustre to the roll of Fellows. Again, after a further dive into statistics, it will be found that of the thirty-four Fellows who sit on the present Council fourteen were outsiders; and yet were I to read out the names of the fourteen you would certainly agree with me in thinking that the Institute would have acted most unwisely and lost a great deal had it refused to admit them as Fellows simply because they had not previously been members of the class of Associates. On this point, which I know full well is a delicate one, much misapprehension seems to exist both within and outside the Institute. In the first place, there is an abnormal amount of hesitation on the part of Associates long in practice to proceed to the higher grade, though we all look for such a sign of movement in its ranks, and think that justice is not done to the high position the Royal Institute of British Architects is gradually acquiring while little or no progress is made in such direction. In the second place, too many practising architects of repute, and even a few of well earned distinction, form no part of the Institute; forgetful, as too many of them are, that their influence and usefulness would be infinitely greater

* By Mr. Wigfull [A.], Institute Medallist for 1894.

† Mr. Glazier [A.] is associated with Mr. Crane in this work.

‡ Mr. A. N. Paterson [A.] and Mr. W. J. Anderson [A.]

§ Mr. Bidlake [A.], Institute Medallist 1885, is the principal lecturer.

¶ Mr. Howdill [A.] continues his course of instruction.

* Mr. Cecil Orr [A.].

were they members of the corporate body, prepared to discuss important matters without bias, and to sink details of difference in a spirit of compromise, without which no corporation, community, state, nor government of any description can ever be successfully carried on.

Colleagues and gentlemen, I am about to make a suggestion which I hope may be received with favour, or at least with goodwill equal to that with which I venture to formulate it. This is the first occasion I shall ever deliver a Presidential address from this chair. Though I am not the junior Fellow, yet I applied for admission to the Institute as an Associate in 1845, and this coming January I shall have been fifty years a member. In the strength of long acquaintance with those present here to-night, and with many others who, as I am lost to us, I venture to make an appeal to the good feeling, the good sense of British architects everywhere, whether members of the Institute or not—whether they call themselves artists or professional men—to join hands and form a united front to all and any who would do us wrong, either from an artistic or a business point of view. Let us, on our part, convince the outside men—men of distinction, men of repute, who are not members of this body—who gladly shall see the barriers removed which prevent them from joining us; and how willing we are to do whatever is reasonable to remove them. It is not for us to say that possibly some of the barriers would be to may not be, to some extent at least, of our own raising; and it would be a very fit object for our Council to discuss whether greater facilities could not be made for the admission of fellows from among those whose career shows that they would be worthy members of our body, looking at architecture as a career in which the essentials of art and business have been presented, though not always in equal degrees combination.

It has more than once occurred to me during my tenure of office, that one of the main reasons for the recent startling paucity of applicants for Fellowship is the possibility that architects of mature age, men who have carried on extensive practice for the greater part of their lives—men whom we wish to see Fellows of the Institute, who are not, and never have been, Associates hesitate to take their chance of election at the hands of a body of electors, some of whom are only within recent years emerged from the position of pupils. It seems to me, for instance, somewhat sanguine to expect that men who are well-known members of the Royal Academy, the Society of Antiquaries, and of other institutions in which for a long period they have been recognised as architects of repute and distinction, will consent to run the risks of an election dependent on the good- or ill-will or the prejudices of some thirteen or fourteen hundred gentlemen, the vast majority of whom are their juniors, and some of whom are not even in practice. I, therefore, though with great diffidence, and with all respect for the moral authority of my colleagues, urge the Institute to consider whether the power of admitting such persons to those to whom I refer to the class of fellows may not be confided solely to the governing or governing body of the Institute, at least for the space of a year, or perhaps two years. The regulations which guide the Council in the admission of applicants for candidature as Fellows are sufficiently definite to constitute a check on any improper attempt to take such admissions too general or indiscriminate. The change may be effected by the suspension of certain by-laws; and though such suspension requires the sanction of the Privy Council, I feel convinced that when the facts are properly explained, their lordships will acquiesce in the petition which it would be our duty to press to them. What I propose has good precedents to support it. For instance, in my own club—the Athenæum—the committee have power to select from time to time distinguished persons about submitting them to the chances of a vote of the whole body of members; and this has held to be a great honour by the persons themselves, while it is certainly of high advantage to the club. The way being thus opened, I venture to think that the Council would have little difficulty in reaching the majority of those whom we consider should be part of the corporate body, and in effecting, to a great extent, the fusion of ourselves with many, especially in the provinces, to present the position in which they are placed, no fault of their own; but who are, nevertheless, forced to remain outside the ranks of the Institute, to our mutual regret, and, perhaps, to latent annoyance of both.

I trust that this suggestion, for which I hold

myself solely responsible, may be deemed worthy of consideration by the Institute in general meeting, and that the result may prove as beneficial to all the parties concerned as I confidently expect.

Mr. Aston Webb proposed a hearty vote of thanks to the President for his address, containing, as it did, many suggestions, which, if adopted, would be to the great good of the Institute. In any notice of the address it would be impossible to pass over the reference that had been made to the late Mr. Ewan Christian, a man who was so noble, fearless, and true, that every one who had the advantage of even half-an-hour's conversation with him must have been the better for it. They all felt the great loss the Institute had sustained by the death of Mr. Christian. The principal part of the commencement of the address had been taken up with the subject of competitions. The President had pointed out that it was extremely difficult for the competitors, without consultation with the promoters, to ascertain what their requirements were; but most competitions were instituted by committees, and not by individuals who knew their requirements. Those who had much to do with committees would generally find that they did not themselves know their requirements. Life was only speaking of competitions on a large scale, because he believed that competitions for small buildings were a mistake; but where the conditions were intricate it was rather the architect's duty to suggest how the objects of the promoters should be met by the requirements of the building. With regard to material alterations in the design after it had been chosen, with all deference he had generally found that a competition design, which had been chosen by an able assessor, did not require any alteration. Drawings would have to be re-drawn, but he believed that the general lines did not require to be much reconsidered. As to the cost of the competition designs, the President had mentioned the case of a comparatively small building at West Ham, he believed, where he had estimated the cost of each design at 400*l*. He might say that, in conjunction with his friend, Mr. Bell, with whom he had had the pleasure of going into most of the large competitions, they had never spent anything like that amount on any competition design, and he certainly thought it would be a very bad day for the profession if money had to be spent to that extent in preparing competition designs. He believed it was the aim now of assessors in preparing conditions, and it should be their aim, to lessen the expenses of the work, which had to be met in preparing the designs for competition. As to improper conditions, they, of course, felt that very often conditions were sent out, which bore hardly and improperly on the architects, and under such circumstances the competitor should cease to compete, and take no part in the matter. On the other hand, however, he ventured to think that it did not altogether absolve the promoters of the competition from acting fairly, even if the competitors had, to some extent, placed themselves in their power by adopting those conditions. A recent case had arisen at Durham, where the conditions were certainly clearly stated, to the effect that they did not undertake to employ the successful architect, but he thought that hardly absolved them from doing so without showing some very good reasons for departing from that course. No doubt they were aware that the Council had written to the County Council of Durham, urging that, in fairness, the successful competitors should have the work, unless there was some good reason to the contrary. With regard to the selection of an architect by committees or promoters, he was not quite sure that a committee was more likely to select the better architect than they were to select the better design. As a rule, committees were totally ignorant of both architecture and design, and he was not sure that the one case would turn out better than the other. As to the power of the assessor to advise, he thought the Institute had always felt it was very difficult to ask a body of men to actually bind themselves by any award of a professional man. If a man went to a doctor, asked his advice, and was recommended some very stringent thing, the patient did not undertake to follow the advice, although it might have great weight with him. In the same way, if a client went to a lawyer, he might be advised to go to law, and probably would; but still the client would hold himself free to do so or not as he thought fit. If, then, the committee undertook to be advised by the professional assessor, it was almost as much as they could be expected to do. It had been laid at the door of the Institute that

they had not done as much as they might have in the teaching of architecture, but he thought that the course they had taken had certainly given a stimulus to architectural education all over the country, and had given an indication to young men as to what they should learn. Unless architects learned when they were young, however artistic a young man might be, he would be working at a very great disadvantage. The Institute was, therefore, working with the aim of encouraging young men to know while they were young, so that when they grew older, they might not have to spend their time in acquiring elementary knowledge which they might have gained in their youth. They all regretted the paucity of new Fellows, and any suggestion by which that could be done away with would be most grateful. On the other hand, the Associates were increasing largely, which meant that new blood was coming into the Institute in large quantities. This must tell in time, and make the Institute perhaps even more vigorous than it had been in the past. He could not think that anybody would dissent from the suggestion to admit Fellows through the Council, and they were very much indebted to the President for suggesting such an admirable course. It would enable the Institute to honour those whom they might wish to honour, and it would be an honour to those who gave and to those who accepted it. The Institute had now been for more than sixty years endeavouring to do what it could. In the early times men like Sir Charles Barry and Professor Cockerell were actively engaged in it; in later days they had had Scott and Street and Burges, and men of that sort. At the present day they had many of the most distinguished architects helping them, and it could not be supposed that such men would spend their time if they did not think they were working for a worthy object. Their aim, however, could not be attained unless they had the assistance of nearly everyone, and he thought they had a right to ask them to come and help, and give them the opportunity of aiding those who were less fortunate than themselves. It was said that they were working in the interests of architects, and not in the interests of architecture, but surely this was the way in which the Institute could work in the interests of architecture, and in the way of improving design, and the Institute asked those architects who did not now help to assist by their presence in inspiring enthusiasm and love for their work in the young men, and so they would be doing a very great deal for architecture, and for that reason they were very much indebted to the President for the suggestion he had made.

Mr. W. D. Carie, in seconding the vote of thanks to the President for his admirable address, said they were conscious of the long life and devotion he had given to the great cause of architectural scholarship—he might say of scholarly architecture—and for that devotion they and, he might say, the world were enduringly and gratefully indebted. If he might single out any one of the comments the President had made, it would be that in which they were told that the truer the architect the more readily he might dispense with mere ornament in producing his design, which might be even the statelier and the comelier for its very simplicity. He had been very interested by the President's admirable and practical reference to the partial adoption of the metric system in use on the Continent. Mechanical science had to some extent come to their aid, and it was a fact worth noting that the usual foreign scale adopted for drawings, viz., the 100th scale, was nearly allied to the English 32nd scale, which was virtually a 96th, and homogeneity was to be found beyond that point in the points of proportional instruments. He had followed what had been said as to the admission of Fellows by the Council, with a great deal of interest and pleasure. He did not know who had the privilege of being the youngest Fellow among them, but he felt if things went on as they had been going, that a time would come when that youngest Fellow, if he attained his full measure of life, would remain the sole and only occupant of the chair, because he would be the only one whom the constitution of the Institute would allow to assume the purple. He could not but hope most heartily, therefore, that the general body of the members would acquiesce in the excellent suggestion made by the President.

The vote of thanks, on being put to the meeting, was carried by acclamation, the President briefly replying.

The President announced that the next meeting would take place on Monday, November 18, when Dr. Murray would read a paper on "The Sculptured Columns of the Temple of Diana at Ephesus"; previous to which the portrait of the

ex-President, Mr. Macvicar Anderson, would be formally presented to the Institute.
The proceedings then terminated.

MODERN BUILDING DESIGN: POSITIVE CONDITIONS.

Mr. Lethaby said that he had endeavoured to show in his first lecture that the object to be aimed at was to improve the whole of building, not to exalt architects, who had probably only to deal with one-twentieth part of the building done in England. They must set themselves to stir the main body of workers to observation and experiment, to bring to their minds that there is a beautiful way of doing things, and that ornament was not a mere convention for squandering their labour. Education must therefore be based on constant and positive conditions of handwork, utility, stability, and lastly on reverence for tradition and nature. Harmony with the rest of nature was the great rule of art; old building work was the crowning interest of landscape, while new towns blight and wither the country round them. Nature furnished well-defined positive conditions which resulted in the differencing of local types when building was grown on the spot. Nature too was a vast reservoir of artistic ideas. They must throw away their burden of the thousand years dead palmettes, eggs and tongues, and mouldings, all the trappings of the styles improperly called "revived" when they were only "exhumed," and open their hearts to nature. Much more was involved in this than mere ornamentation, a work might have none of that and still be a part of nature, as some Cistercian abbey as simple as a barn, or the houses in any unimproved village in England. To see the real relation between nature and architectural design they must not look at nature in the landscape way, but at the actual facts of form, colour, and arrangement, the plan and pattern of things. In this way they could get fresh ideas for the modelling of forms, for agreeable textures and harmonious arrangements of colour. Talk about conventionalism and abstraction was often so much verbiage to cover the fact that we had forgotten that ornament should delight. The highest purpose of ornamentation in the whole of the arts was the gathering out of nature those particular facts and expressions best fitted for the matter in hand, leaving the water-colour painter's view to the water-colour painter, the botanist's view to the botanist.

He now passed to tradition as furnishing us with the second group of positive conditions, but the methods of studying old art must be reversed; instead of classifying their observations historically by time, place, and differences of style, they must consider them as constructive expedients to meet definite requirements. If they put away the styles, and regarded these old facts from their own proper standpoint, they would observe that the results were the direct outcome of the use of certain materials. They might get more from antiquity from such a method than by collecting sketches of features, and recombining them in make-believe Classic, Byzantine or Gothic buildings. A design of to-day in the Early English or Perpendicular style could not be made Gothic by writing on the plans in black letter. Out of the critical use of past tradition, they must build up a tradition of their own. The third corner stone in any positive foundation for a modern building was need or utility. It might be said that as soon as you put pencil to paper, some distinctive style would come in; but when the drawing had been made, could they not begin again, and hunt down every trick of style one at a time, engaged columns and pilasters, pedimented windows, &c. Having cleared out all these they could add another foot to the substance of their walls, or have a real hit at the imagination, in some little panel seriously attempted. They could line the front door with silver, if they must get rid of the money. The fourth set of conditions were those given by materials and the manner of working them. It was not by some impossible return to some art Eden, a general agreement on a "point of departure" and a "point of view," but by a common sense adaptation of means to ends that they would form a school of art. All finished forms and ornamentation were direct outcomes of the tools in the hands of a thinker. A potter, for instance, thought with his thumb; he might begin with an idea, but the pot insisted on developing in an unexpected way. If they got a designer to design a pot, he could only generalise a

* Is not this partly a question of size? Old towns were mostly small, and closely confined by definite walls; modern towns are large areas of country covered with buildings. Were the buildings all of the best quality, the result in this sense would be the same.—Ed.

notion from a number of pots done by potters. So the learned architect, as far as the art of building goes, could only draw versions of the real work done by old masons and carpenters. "Man," the definition ran, "is an animal who uses tools." They might add, "a designer is a man who doesn't." What was true of ornament was just as true of detail. All building details should first be functional, and of the nature of bearing blocks, sheltering projections, and so on, and then each must be made suitable for its special purpose by special thought; it would thus become rightly original and organic work. They must cast aside all these cornices, entablatures, strings, and so on; there were surely infinite possibilities open to a rational growth of architecture, which should examine once again the first ground-work. All consideration of architectural results led us back to material, determining conditions. There was no such thing as agreeable abstract proportion in architecture. Proportion was a relation of parts conditioned by scale, materials, and habit. Simple ideas of proportion arose from convenience and stability, to which were added some associations gathered from nature, and the whole was confirmed by custom. The classic proportion for doors and windows was supposed to be a double square high. Now 3 ft. 6 in. wide and 7 ft. high was a convenient size, possibly it was the average size. If men had been accustomed to roll themselves through doors long-ways, they might depend upon it that true æsthetic proportions would have been the other way about.

Just as the architect had become a professional man, so was the builder developing into a financial agent; he was ceasing to build. The modern method of competition in tenders was entirely vicious, and could only lead to the ruin of good work. We could only get good building by a method which would allow the builder to build well, thus engaging his interest, ambition, and credit in his art. Under the competition system could we wonder that the old builder grandfather in "The Wrecker" complained of the lack of "originality" in builders. "Cement," he said, "would take much more sand than anybody supposed." On the competition system of tendering rested the absurdly inflated modern quantities. The waste round about building and the starvation at the centre was most grievous; the modern ideal was, instead of spending 75s. directly for one hundred pounds' worth of building, to get a colourable imitation for 75s., spending 50s. in getting it done. First came the employer, who provided the capital; then the architect, who usually employed several journeyman architects; then the surveyor; then the contractor, a middleman employing sub-contractors. The clerk of works followed, and then sixth came the builder's foreman, generally a very skilful man, who had gained his place by natural selection; here at last we had a man who could build, but he was too busy with the time-sheets; then came the workmen. The money interest displaced every other duty, stratum after stratum, till the chief function of the builder's foreman was to look after the contractor's margin of profits. If we wanted sensible human building, the centre of the work should be approached from both sides. At the base of the pyramid stood the workmen already organised according to their crafts. Technical education had fairly set in, and it offered much towards a liberal craft education; and when an enthusiasm for good work, thus aroused, filtered through all the crafts, the Unions would, he hoped, become like the old Guilds, and quality of work would become an object, and the best workmen would be selected as being capable of being directors of building. To stimulate the workmen to the highest pitch of thought and energy positions of the widest trust must be open to them.

Artists in building must be trained in association with other artists and workers, and "design" must be thought about as the natural outcome of the work and not as something superadded to it. It was imperative that architecture, which was the proportionate association of crafts, should take its place in this comprehensive scheme of craft education, which might finally lead up to some central higher Polytechnic where the most skilful and thoughtful students would be brought together, but where the workshop should, as in engineering, be made the necessary basis and starting-point. A young architect who had spent a year in a school of masonry and a second year in the plastering and plumbing and wood-carving classes would thereafter stand in quite a different relation to material and so-called design.

Under such circumstances construction might be carried much further by an extended analysis

of the possibilities open to it. What ways could be suggested of finishing a fireproof floor in a satisfactory way? How might the ordinary dirt-trap floor be improved out of existence, &c.? A thousand such problems might be attacked from the point of view of beautiful serviceableness. While going through such an intellectual training the student should be surrounded by examples, the loveliest that could be gathered, of cast-iron large photographs, finely-wrought drawings; but these should be for spiritual stimulus, fruits of a tree of life not to be plucked. The general powers given by mathematical training of seeing in three dimensions, and the grasp of mechanical principles, would doubtless be of great service. He wished it were possible to throw the architect and the engineer more together, so that the architect might learn something of iron construction and the engineer might discover that scientific precision and refinement of adjustment, and not an overlay of base ornament, was the best "art" in engineering. Geometry should take a larger place in architectural training. During the period of organic architecture every expedient in the way of composite curves was open. We wanted to abandon the dreary semicircular and pointed arch theory of building. Vaulting and other matters should be investigated geometrically, not archaeologically. But geometry of this kind must be used as a means of seeing only; no fine school of building had been governed by definable geometrical forms; there had always been a system of shading, as it were, one quantity into another by obvious or imperceptible modifications; axes were bent, upright lines were inclined, curvature took the place of straight lines, &c. We were ready to admire this method of design in a tree, but repudiated it in building; the T-square had got into our brains; an old building was modelled in the solid, not machine-set-out from $\frac{1}{4}$ -in. scale drawings. To build, not to trick out designs on paper, was the function of the architect. Books and fine drawing, and the enthusiasm that came of the sight of lovely old monuments, were only means and we could not be sure that they were ever good means. What we wanted was good building architecture, not designs; accomplishment, not projects; experiences, not hearsays. Design could not be taught, it could only be suggested as primarily the outcome of requirement, material traditions, and pleasant workmanship under the inspiration of nature and tradition. These had been the conditions of every living school of architecture, and only by getting into relations with such ruling facts could we hope to build up an architecture at once scientific and beautiful—Positive School of Architecture.

Mr. H. H. Statham, who was called upon by the Chairman, said he would be glad to propose a vote of thanks to Mr. Lethaby for his two very remarkable, eloquent, and interesting papers, and also to say with how much sympathy he had listened to a great deal in the spirit of them, although, in certain points, he was inclined to differ from him in opinion. Everybody would admire the earnestness and the soundness of Mr. Lethaby's views on architecture, and a great deal of what he had said, in his second lecture particularly, really seemed to point out a new system of studying ancient architecture: he referred to Mr. Lethaby's suggestion that we should study constructionally, rather than as a matter of style—a suggestion which promised a new reading of the meaning of style. He (the speaker) agreed with much that had been said, in both lectures, as to the desirability of getting architects more closely into contact with practical work, but he could not altogether agree with Mr. Lethaby, in his thought that the conditions under which architecture was practised before the Renaissance had ceased since then and that they could not now, or ever again, be revived. Mr. Lethaby was of opinion that no really great work had ever been done where what we called an architect was the designer of the building. That might be true of the Middle Ages, but was it true of the Greeks? The names were known of architects who were distinctly stated to be the architects of several Greek temples, and the refinement of detail in settings out Greek temples was such that he did not think it could possibly have been done unless set out beforehand. Mr. Lethaby had said, and admirably said, a great deal about Wren, calling him "the last of the Romans"; but had he quite forgotten Sir Charles Barry? Barry was no so great a genius as Wren, but he was a genius of the same type, a born architect with a faculty for seeing what treatment was fittest for each problem put before him. Le

to take the Houses of Parliament, and admitting that the detail of that building was the work of Tudor (they must not forget that that was imposed upon Barry by the Government), in his opinion, in plan and conception, and grouping the Houses of Parliament as one of the finest and most thoroughly rational architectural conceptions in the world, ancient or modern. And that building was erected by a man who was a "professional" architect in the ordinary sense. But he principally differed from Mr. Lethaby in that that we were in a different position to what existed before the Renaissance; that was open to us in books; we had the cities of travel, and could see the great buildings of the world, and we could not work in an instinctive kind of way in which the great builders did. We could not, in fact, work in one style unconscious of the works of the past. It seemed to him that what we needed was a few architects—that was to say, for some reason or other the genius for architecture was rather quiescent at present. His effort to produce originality by going down to the workmen for it, he did not think would ever succeed in producing more original than under the present system, though it did certainly lead to a new study of the technical details of building. In his opinion it was the object and joy of an architect to make buildings a complete architectural thought, and a man who had the good fortune to erect a building should not rush after other works, which he could not properly see, but he should give his mind to that one, and should make every detail appear to belong to and to no other. He (the speaker) did not see how that could be done under the system suggested by Mr. Lethaby. In his opinion a workman would always have to go to the architect's mind, and if he (the speaker) had the opportunity of carrying out a design for a large building, he would be glad to avail himself of the services of Mr. Lethaby's skilled workmen, but he would take very good care that they did not carry out his details and not their own. Mr. A. T. Bolton, in seconding the vote of thanks to Mr. Lethaby, said that while it might be regretted that the majority of every-day architectural features should be regarded as obsolete, that it was desirable to obtain artistic effect by other means still, a point that was often overlooked, was that the pleasure of association derived from the use of the detail of old buildings could not be got rid of; thus it was natural that a person, whose interests were bound up with the Renaissance, for instance, should require in building many such old architectural features. This applied still more closely to church architecture. In building a modern church, an architect could not forget the past, for a body which had existed for eighteen hundred years, and if they wanted to get what might be called a church effect, they would find themselves compelled to make use of many of the old details of expression. In his opinion, the pre-employment of architect-workmen was the result of the unfortunate system of not employing resident architects, as was done in France, being one of the best features of the French system. To be actually on a building, especially where some responsibility attached, was far superior to the series of Polytechnic classes. The Chairman then put to the meeting the vote of thanks, which was carried unanimously. Mr. Lethaby, in reply, said that what he had to show was that modern architectural schools had produced just—London. That was it had produced, and the same methods would produce very much the same thing. Unless the outcome of experimental building a building, an architectural design was, he thought, impossible; he could not conceive it: he was nothing about it; but supposing it possible that such a design could be created by that possible architectural genius; if it were carried out by machinery would it give any delight? Certainly not. Would it be done by mechanical labour? The meeting then terminated.

SANITARY INSPECTORS' ASSOCIATION.

At the first meeting of the new session of this Association was held at Carpenters' Hall, London, on Saturday last, the President, Sir B. W. Richardson, in the chair. After the formal business of the Chairman of Council, Mr. H. Thomas, read the annual address, which dealt with some of the leading sanitary questions of the day.

He would be delighted, he said, to see every city, town, and parish in the kingdom following the example of Liverpool in providing free baths for the poor, and he pointed to the example of the "Guinness' Trust," which was making provision in all their new buildings to give every tenant an opportunity of getting at least once a week a hot or cold bath, as a step in the right direction, which ought to be followed by all owners of model dwellings. Instead of the Coal and Wine Dues, which had, unfortunately for Metropolitan improvements, been unwisely abolished, he thought they should resort to the taxation of land values. In the Metropolis and in many provincial towns there were still large numbers of back to back houses where a proper provision of space for light and ventilation was impossible, and he thought the legislature should seriously consider the absolute necessity of giving to local authorities, not merely permissive, but compulsory power to acquire sites for the erection of suitable dwellings for the working classes. The London County Council was greatly responsible for the backward condition of London in this matter, though not being liberal enough in prescribing for air spaces surrounding buildings in the metropolis. The paper advocated the acquisition of common lodging-houses by municipal authorities, with a view to improvement in many of them, which were hot-beds of filth and disease, and sternly denounced the Salvation Army Shelters, where human beings were crowded together like beasts. The habitual over-crowding of railway-carriages at certain hours of the day called imperatively for improvement. Persons suffering from diphtheritic sore-throat and other communicable diseases were huddled together for long periods, compelled to inhale each other's breath in carriages which never appeared to be disinfected or properly cleansed. While provision had to be made for cleansing and disinfecting cattle-trucks no consideration was shown to human beings, the law appearing to be inoperative in their case. A liberal air-space in all public vehicles with efficient mechanical ventilation by suction-fans or other means ought to be provided by public enactment, and it should be made a punishable offence to use such a carriage a second day without previously cleansing and disinfecting it. Light railways should be provided, by which articles of food could be brought into London and valuable refuse be sent out to the farmers. Suggestions were made for the improvement of the deplorable conditions under which a large floating population working barges on the Thames are living; for the establishment of municipal markets in all the districts of the Metropolis; and for better provision for hop-pickers. In concluding the paper, Mr. Thomas congratulated the late Home Secretary (Mr. Asquith) on having passed through Parliament a grand piece of legislation in the new Factory and Workshops Act, which would come into operation on January 1 next. It gave sanitary inspectors power to deal with overcrowding; fixed the minimum air-space at 250 cubic feet per person by daylight, and 400 cubic feet by artificial light other than electric light; prohibited the making of wearing apparel in any house or building where a case of smallpox or scarlet fever existed, and compelled medical practitioners to notify such cases. In future, fire-escapes must be provided in factories employing a certain number of persons; and the responsibility of maintaining tenement factories in a proper sanitary condition will in future be thrown upon the owners. The same Act dealt with underground bakehouses, all such places not already in existence on January 1 being prohibited. The Act, he believed, would prove to be one of the most valuable enactments ever passed for the benefit of the toilers of this country.

A discussion followed in which the President, Mr. West (Walthamstow), Mr. Jones (Lambeth), Mr. Young (Battersea), Mr. Lightfoot (Chelsea), Mr. Jacklin (Maidstone), Mr. Dee (Westminster), Mr. H. Alexander (Shoreditch), and other members took part.

Sir Benjamin Richardson said he looked upon the work they were doing as just the kind of work he would have wished to see done at the commencement of his professional career, forty years ago, and he hoped they would go on increasing their influence in every possible way. He commended the paper as a very practical and suggestive one. In his early days he had been looked upon as a visionary when he predicted that the death-rate might, by proper attention to the laws of health, be reduced to 15 per 1,000; but men like Dr. Farr admitted to him privately that he had not overestimated the number of diseases that might be entirely prevented, and

that nothing but time was required to bring this about. They now saw how that prediction had been fulfilled. He agreed with nearly all that was said in the paper, but he did not admit the charge of indifference made against the medical men. He supported the views of the paper with regard to the question of free baths, the improvement of lodging-houses and of the means of locomotion. It was true that we made our own diseases. Improvements had certainly taken place, for they used to estimate that one doctor was required for every 900 of the population, now the estimate was one to every 1,600, but there should be not more than one doctor for every 3,000 of the population.

A cordial vote of thanks was given to Mr. Thomas, who in acknowledging it, replied to the various criticisms that had been offered.

THE PROPOSED BUILDERS' CLERKS' INSTITUTION.

A MEETING of the proposed Builders' Clerks' Institution of Great Britain was held on the 2nd inst. at the Westminster Town Hall.

Mr. J. Pearce Bowditch, who presided, said that the objects of the proposed Institution were to form a bond of union between builders' clerks throughout the country; to establish a fund for temporary assistance to those out of employment, viz., a sick benefit and pension society; to open a register for employment, to which both employers and employes may have access; to form centres for gathering information as to the state of trade, with a view to advising builders' clerks contemplating a change; and to generally improve the status of clerks employed in the trade. A similar institution had been formed in Birmingham, which was making good progress, and the secretary, Mr. W. G. Lettis, had written to him pointing out that no doubt they would form a London centre in affiliation with Birmingham, and that eventually London would become the headquarters or chief centre. In the course of his remarks Mr. Bowditch stated that fifty-five applications for membership had been received from various parts of the country.

After an informal discussion, a committee was formed to draw up a plan and circular of the proposed Institution, and soon after the meeting was adjourned.

ENGINEERING SOCIETIES.

INSTITUTION OF JUNIOR ENGINEERS.—The inaugural meeting of the fifteenth session of the Institution of Junior Engineers was held on the 1st inst. at the Westminster Palace Hotel. In the absence abroad of the retiring President, Mr. Alexander Siemens, M.Inst.C.E., the chair was taken by Professor A. B. W. Kennedy, LL.D., F.R.S., past President. The institution premium of the past session having been presented to Mr. Ernest King and Mr. Kenneth Gray for their paper on "The Warning of Buildings by Hot Water," the President-elect, Mr. Archibald Denny, delivered his presidential address. It dealt principally with the education proper for a young engineer in shipbuilding and marine engineering.

LIVERPOOL ENGINEERING SOCIETY.—The opening meeting of this Society was held at the Royal Institution, on the 30th ult., when the inaugural address was delivered by the President, Mr. Arthur J. Maginnis, M.Inst.N.A. Mr. Maginnis said that it was with great pleasure he addressed them as President of their Society, which it had been his privilege to be a member of since its inception two decades ago, during which period many engineering works had been carried out both in the city and neighbourhood, not the least important being the removal of the bar of the Mersey, the making of the Mersey Tunnel and Overhead Railways, and the more recent connexions to the Riverside Station at the Landing Stage. In the United Kingdom a most interesting and important branch of engineering seemed now about to be revived in the shape of mechanically-propelled road vehicles, henceforth to be briefly described as "Autocars." The recent trials of these in France, together with the development of new motors, and the munificent offer of a prize of 1,000 guineas by the *Engineer* newspaper, had turned public attention to them, so that new fields for manufacture might be opened up, and another source of utility for the splendid roads of this country be extensively developed.



Design for a Public Library.—Section.

Illustrations.

DESIGN FOR A PUBLIC LIBRARY.

THE design here illustrated, by Mr. Percy E. Newton, is that for which the English Travelling Studentship of the Royal Academy was awarded last year; and the view of the façade was exhibited at the Royal Academy of the present year.

The conditions of the competition merely stated that the site was supposed to be surrounded by buildings on three sides, and was 100 ft. long by 60 ft. wide. An area of 20 ft. was to be left above the level of the first floor, and the building was not to exceed 80 ft. in height.

We give the plans of two floors and the section also, which speak for themselves; it is only necessary to add that a librarian's house of seven rooms is provided on the upper story.

PICTURE GALLERY, 2, HOLLAND PARK-ROAD.

WHEN Sir Frederick Leighton's Arab Hall was built, a small room with a glass dome was made on the first floor over the corridor to the Arab Hall, for a painting-room, where a top light only was wanted. This room, however, ceased to be used when the glass studio was added.

Sir Frederick found he had no room to hang the pictures and sketches presented to him by such brother artists as Mr. G. F. Watts, Mr. Alma Tadema, Sir Edward Burne Jones, Mr. Sargent,

Mr. Herkomer, Mr. Albert Moore, Mr. Clausen, and others; so another room was built over the library and adjacent to the old painting-room, the wall dividing them was removed, and its place supplied by black marble pilasters and monolithic columns of pavonazzetto with bases and carved capitals of black marble, an architrave of yellow Numidian marble, and a dolphin frieze. The new room was lit by a glass dome to match the other. A plain black marble chimney occupied the centre of the east side. The two rooms forming the picture gallery are hung with a warm faded leaf-green silk, to form a background for the pictures. When the door into the studio is opened the whole forms a pretty vista.

G. AITCHISON.

LLANDUDNO MUNICIPAL BUILDINGS.

This design, which is by Mr. T. B. Silcock, of Bath, was placed first in the recent competition by the assessor Mr. T. M. Lockwood.

The requirements of the Council, as stated to the competitors, included three distinct departments—viz., (1) Council Chamber and Municipal Buildings; (2) a Public Hall, which might also be used as a Police-court; and (3) suites of private offices. It was necessary to design the building in such a way that any one of these three departments might be used without interfering with the others.

Reference to the plan will show that the Council Chamber is placed in the centre block, and one wing is devoted to the Municipal Offices;

the other wing is to be utilised for private offices, while the Public Hall is placed at the rear of the centre block. There are separate entrances to each wing of the building, and screen-doors are provided for shutting them from the centre portion.

The building is to be of Yorkshire and maenmawr stone, lined with brick, and the walls will be covered with green slates.

The drawing from which the illustration was taken was exhibited at the last Royal Academy exhibition.

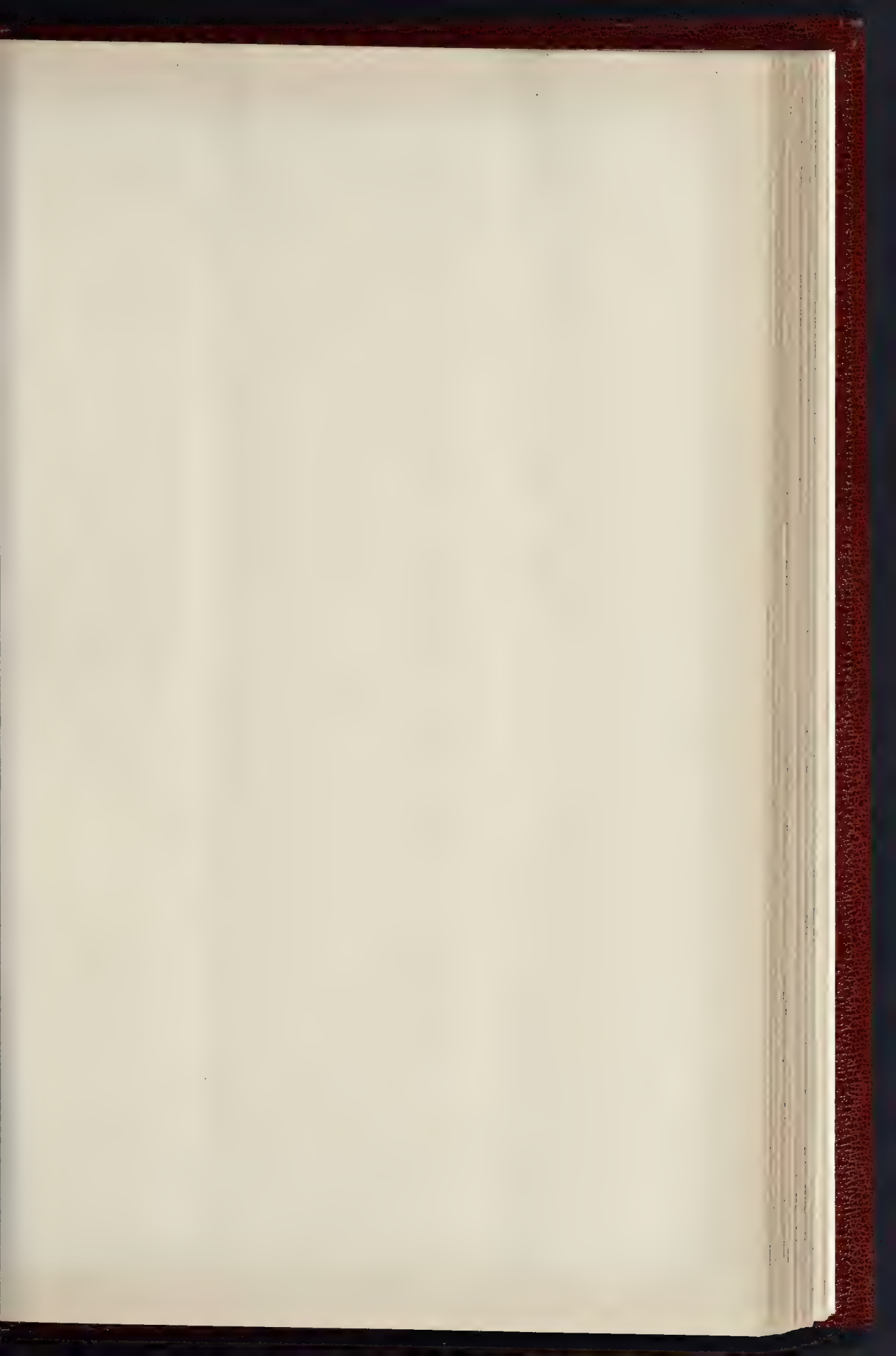
TWO CITY OFFICE BUILDING DOMINION HOUSE, FENCHURCH-STREET.

This range of merchants' offices was completed a few months since, and occupies a position between Billiter-street, and is close to Fenchurch-street Station. The area covered is about 45 ft., and the frontage to Fenchurch-street is about 45 ft., which frontage is carried on Portland and Westwood stones. The base is specially arranged as fireproof wine-cellar.

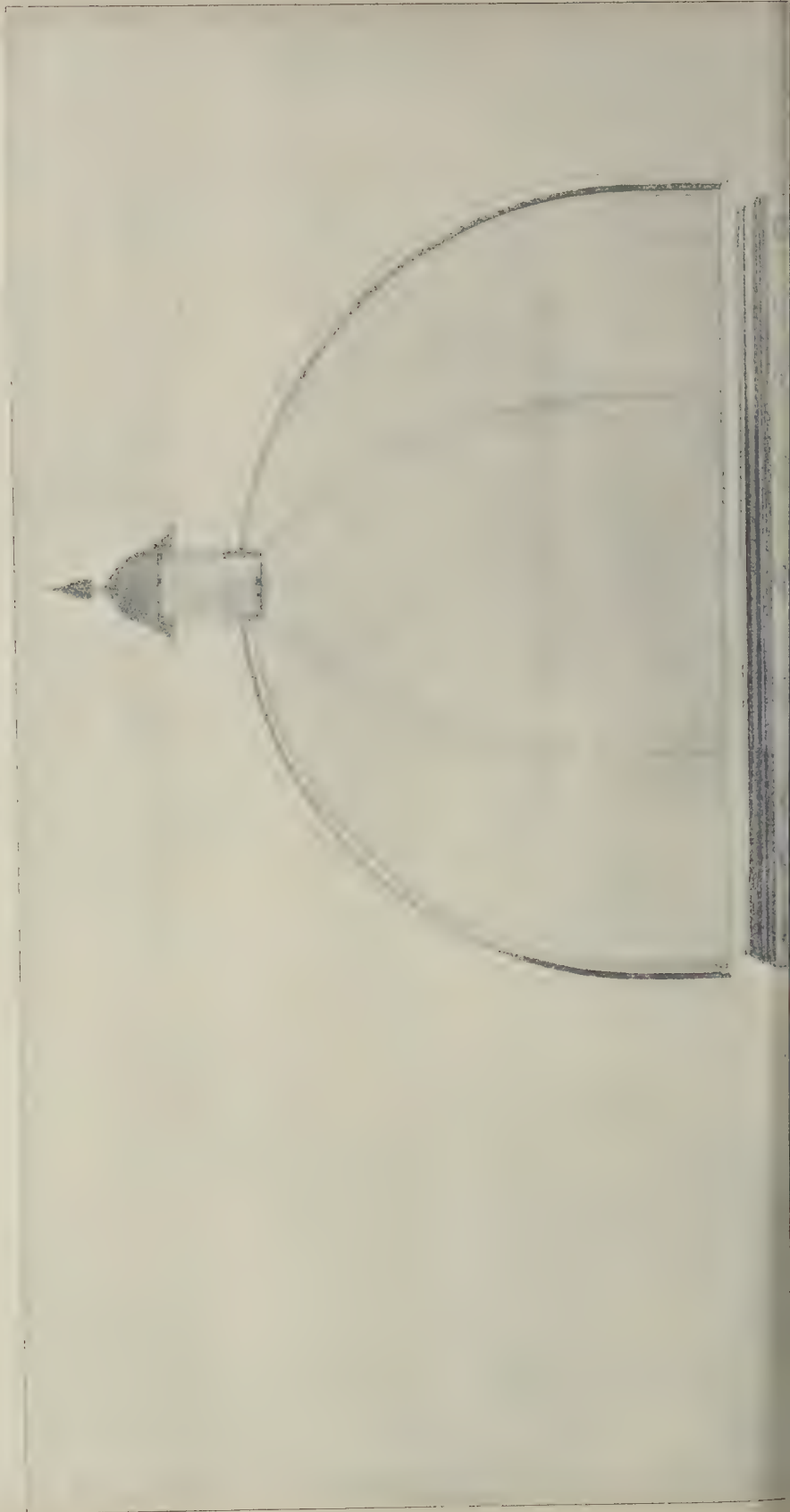
The property was built for Mr. W. Bridge, Messrs. John Allen & Sons, of Kilburn, for a sum of 18,000.

WEST INDIA HOUSE, LEADENHALL-STREET.

This block of offices has a frontage to Leadenhall-street of 53 ft., and return frontage to Sussex-place and Bury-street, and occupies an area of some 7,000 ft. The property is largely dominated by ancient lights, which have a

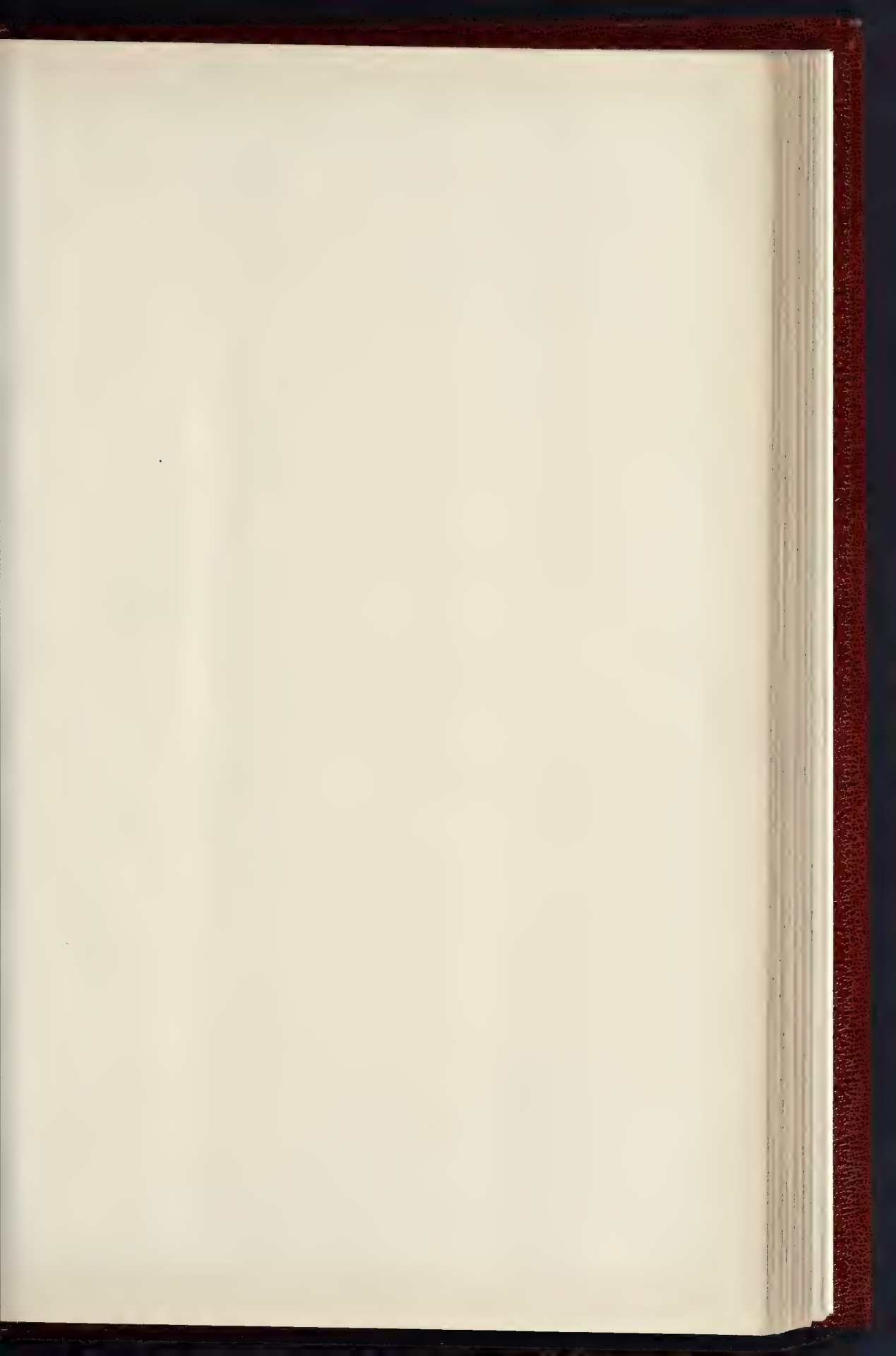


THE BUILDER NOVEMBER 9 1895



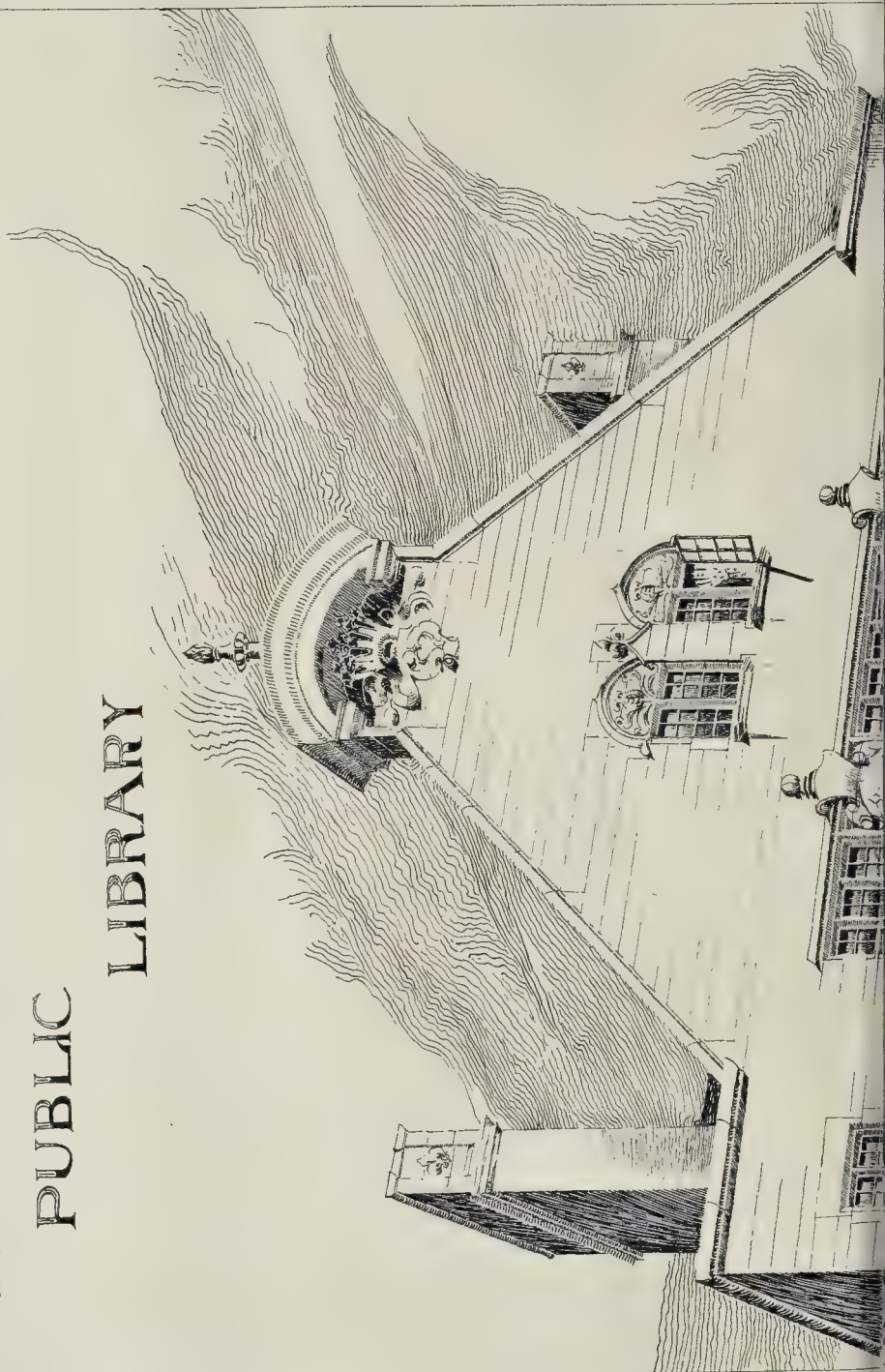


NEW PICTURE GALLERY 2 HOLLAND PARK ROAD W. PROFESSOR AITCHISON, A.R.A. ARCHITECT



THE BUILDER. NOVEMBER 9, 1895.

A PUBLIC LIBRARY



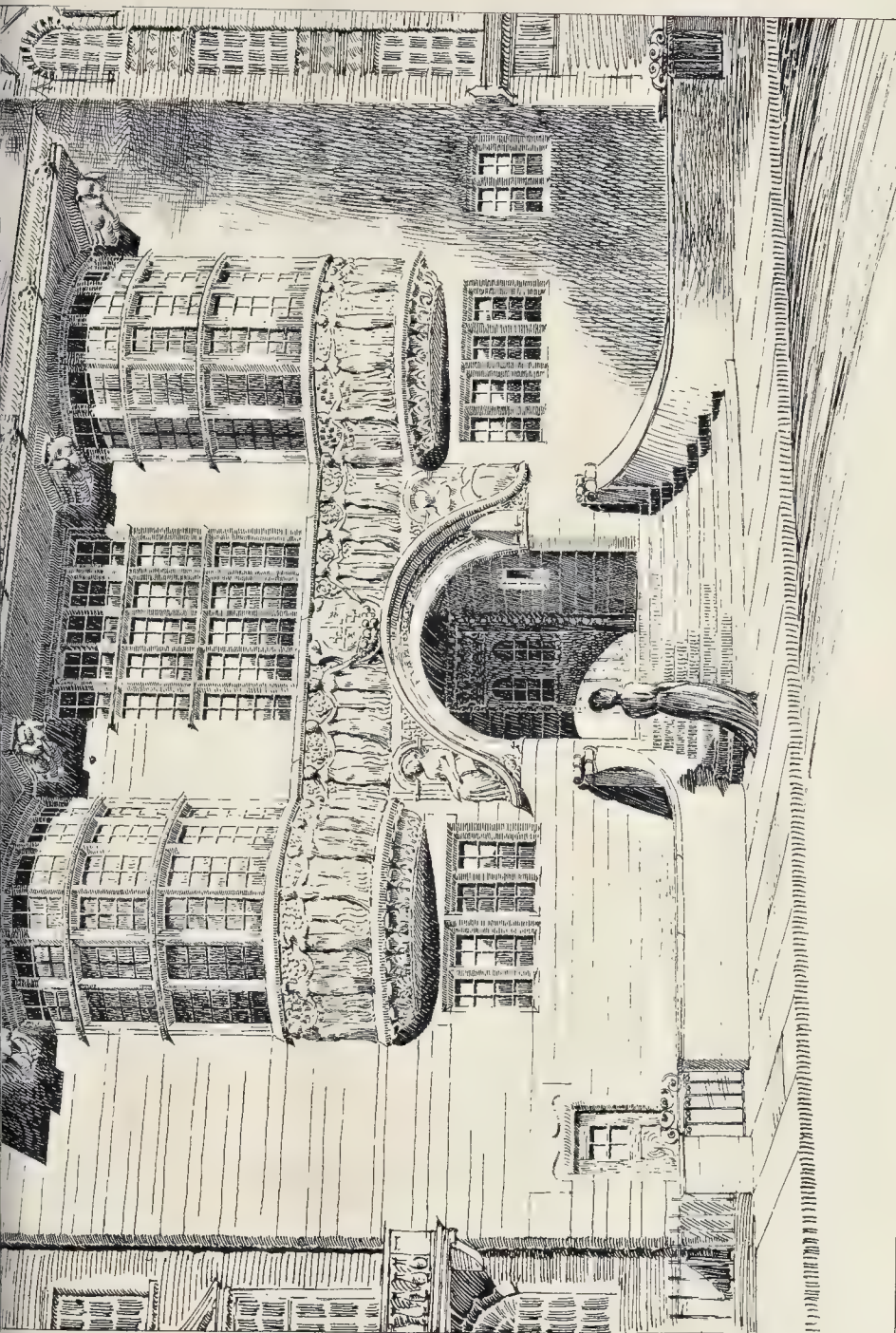


PHOTO BY THE SURGEON GENERAL'S OFFICE, WASHINGTON, D.C.

DESIGN FOR A PUBLIC LIBRARY. BY MR. PERCY E. NEWTON





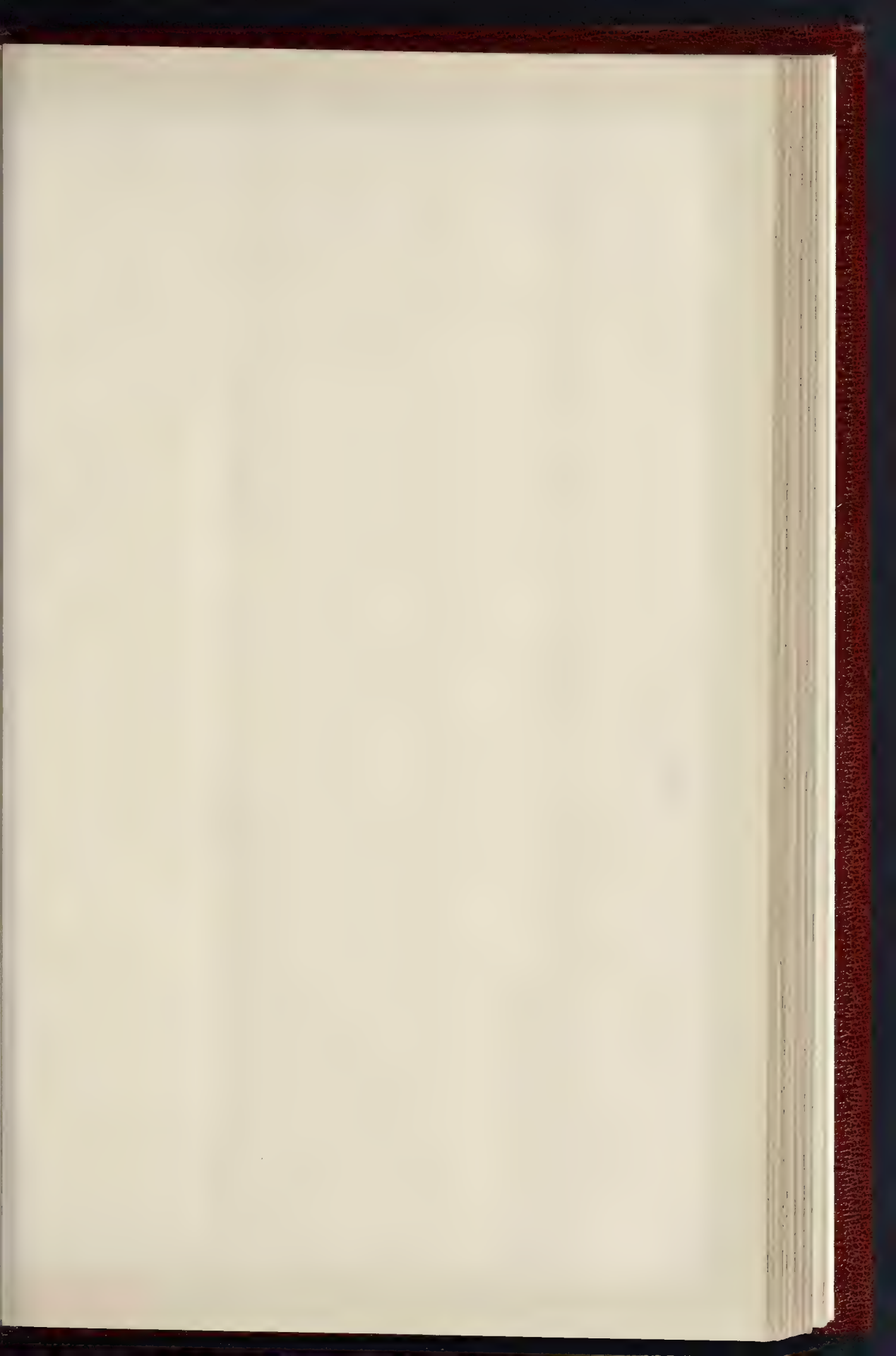
PHOTO LITHO SPRAGUE & CO. 45 EAST HADING STREET KETTER - ANG. E.C.

DOMINION HOUSE, FENCHURCH STREET, E.C.--MR. DELISSA JOSEPH, F.R.I.B.A., ARCHITECT



PHOTO LITHO SPRAGUE & CO. 45 & 47 EAST HARDING STREET FETTER LANE E.C.

WEST INDIA HOUSE, LEADENHALL STREET, E.C.—MR. DELISSA JOSEPH, F.R.I.B.A., ARCHITECT



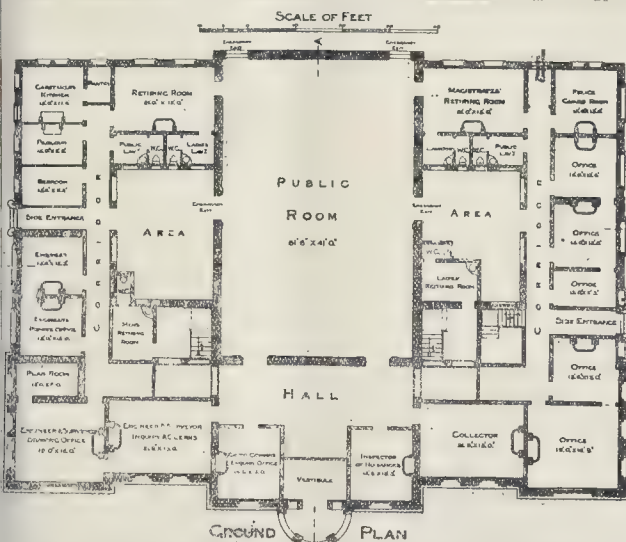
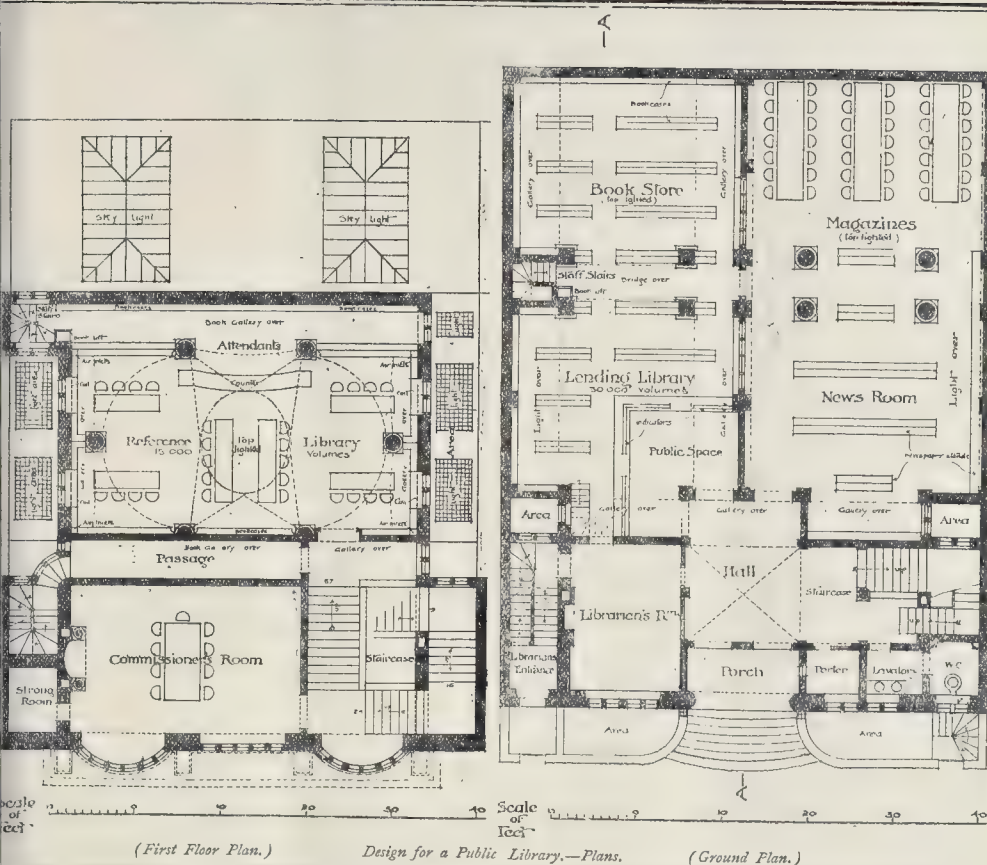


SELECTED DESIGN. LLANDUDNO



NO PHOTO SPRAGUE & CO. 9 & 11 EAST HARDING STREET LESTER LANE, E.C.

DINGS—MR. T. B. SILCOCK, ARCHITECT.



Llandudno Municipal Buildings (Council Chamber in Central Block, over Hall, &c.).

dealt with by the architect without recourse to litigation. The principal elevation is faced out in Portland and Westwood stones and is in white glazed bricks. A main corridor connects Leadenhall-street with Bury-street, and the upper floors are served by a stone-staircase

and an hydraulic lift. The property has been so planned as to ensure uniformly good light to all parts, and has been so arranged as to give limited or extensive accommodation, as required, for the commercial and shipping firms for whom the building has been designed.

The building was formally opened in July,

1894, by Alderman and Sheriff Sir Joseph Dimsdale, who attended in State, and who, together with Mr. Alderman Pound, offered some favourable criticisms upon this and other City buildings of the architect.

The contract was carried out by Messrs. John Allen & Sons, of Kilburn, at the sum of 24,000*l*.

The architect for both the buildings is Mr. Delissa Joseph, of Basinghall-street.

MAGAZINES AND REVIEWS.*

THE *Art Journal* devotes an article to the works of Mr. Lorimer, who is best known or best recollected by most of the public, probably, through his pretty and touching pictures, "The Eleventh Hour" and "Grandmother's Birthday," which were among the popular attractions of two recent Academies. "The Ancient Town of Seaford" is rendered, through Mr. Haité's picturesque sketches, a good deal more interesting on paper than it is in reality. "The making of Axminster Carpets" is described and illustrated, and Mr. Lewis F. Day writes a short illustrated article on "Tiles," which is useful and instructive both in an æsthetic and a practical sense.

The *Art Annual* (in connexion with the *Art Journal*) is devoted to the life and works of Mr. Luke Fildes, RA, the literary portion being by Mr. Cral Thompson, the editor of the *Art Journal*. It is very well done, and is illustrated not only by reproductions from the artist's principal works, but also by a number of sketches and studies of single figures and heads. "The Doctor" forms the frontispiece, and it is interesting to compare with this the original sketch for it given on page 13.

* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.

The *Studio* includes an article on the artistic treatment of cottages, by Mr. Horace Townsend, illustrated by designs by his brother Mr. C. Harrison Townsend. "These are pretty enough, but they are only imitations of a style of building belonging to other days—antiques, and not the genuine picturesque springing out of the requirements of to-day. Mr. Bulkman's article on "Egypt as a Sketching Ground" is charmingly illustrated, and there is as usual a great variety of interesting illustrations of decorative work. The ridiculous coloured print called "Isolde," with no artist's name, but looking like a vagary of Mr. Beardsley's, is, one might almost suppose, inserted as a joke or to see how much readers in the present day will swallow; in any case it is a discredit to any publication claiming to be artistic.

Scribner devotes a paper to the works of Mr. MacMonnies, the American sculptor, who is a very able artist, but seems to be getting tremendously pushed in the press just now; we have come across articles on him and illustrations of his work on all sides during the last few months, the result of which is not entirely to the advantage of the artist. The article on "Landmarks of Manhattan" by Mr. Royal Cortissoz, deals really with some of the architectural aspects of New York, in a broad and sympathetic spirit. Mr. Cortissoz does not entirely believe in letting cities grow up their own way, and has a good word to say even for the (to many) nefarious memory of Haussmann, and for the spirit and largeness of scale which he showed in his Paris improvements. "The great architectural episodes of the world have been focussed sometimes with the spontaneity of a masterly improvisation, sometimes through the cumulative action of years: they have grown and they have been made." It is not every writer on architecture who can see these two sides of the question impartially. The chapter on wood engravers deals with Florian, the illustrations of whose work, including an engraving of a portrait of Walter Scott by Wilkie, show a fine and masculine style of pure line-engraving which is welcome in these days of spottiness and dottiness.

The *Century* contains an article by Mr. Royal Cortissoz on "Mural Decoration in America," well-written but rather marked by the usual tendency of American art-critics to make the most of American work. A fine engraving of the clothed figure from Titian's so-called "Earthly and Heavenly Love" forms the frontispiece to the number.

Harper touches upon art only in its frontispiece, which again illustrates American decorative art, in an engraving of a very charming St. Cecilia picture, a design by Mr. F. S. Church for a stained-glass window for the Grand Rapids Saint Cecilia Society.

In the *Atlantic Monthly* No. IV. of Mr. Peabody's papers on "An Architect's Vacation," dealing with the Italian Renaissance, is very interesting, and contains some excellent critical remarks on the work of Brunelleschi and Michelangelo. Mr. Peabody thinks as an architect and writes as an accomplished man of letters—a combination not always met with.

The *Antiquary* has an illustrated article on "Some Further Examples of Irish Plate," and another on "Water-Marks on Paper," also illustrated; this latter is a curious subject which has not received much attention.

The *Engineering Magazine* (New York) contains a short article by Mr. H. Heathcote Statham on "Contemporary English Architects and their Works," illustrated by a number of reproductions from photographs and lithographs of buildings, which have been very well carried out. It is to be hoped that the personality involved in expressing opinions on living architects and their work may be condoned in consideration that the object of the article (as will be seen from the concluding sentence) was to recommend English architecture to the greater attention of American architects and those interested in architecture. Among other articles in the same number are "The Distribution of Power in Collieries" by Mr. Llewellyn B. Atkinson; "The Limits of Electric Power Transmission," by Mr. Alton D. Adams; and "The Colorado Springs Waterworks," by Mr. Arthur Lakes.

The *Nineteenth Century* contains an article by Sir Charles Robinson on "Art Connoisseurship in England," a criticism of the present position, arguing (we fear with only too much truth) that connoisseurship in this country has declined from the educated taste in works of art of the highest class, for their own sake, to a mere collection of objects the value of which is ruled by fashion, and the standard is their present money-value at an auctioneer's. In the days when the writer of the article made his first art-pilgrimage, "in the

diligence, not on the railway," there was a glorious faith in Venus and Apollo, Greek marbles, Raffaele, Michelangelo, Titian, &c., a faith perhaps too simple; "but surely this was better than the strange quaintness of newly-found Japan or Egyptian gods and scarabs, than hideous Blakes and Rowlandsons, than pots and pans and maudlin Bartolozzis and coloured prints." One cannot quite forgive Sir Charles for grouping Blake with Rowlandson, but otherwise his protest is not without cause. Mr. Hadden's article in the same number on "The Change of Our Musical Pitch" should be read; it will be found to be a much more serious matter, in a practical sense, than a mere question of musical taste or theory.

In the *Pall Mall Magazine* Mr. Grant Allen (who had only finished in the last number one division of his subject of "Evolution in Early Italian Art," and not the whole, as we supposed) writes a very interesting article on the subject of "The Presentation in the Temple," showing the curious persistence of nearly the same traditional arrangement and the same personages in a series of paintings in chronological succession. The third of a series of articles on "Unknown Paris" deals with artists, their haunts and their portraits. A poem by Louise Chandler Moulton in the same number is illustrated decoratively in a rather bold and striking manner.

Le Monde Moderne includes a most interesting illustrated article on the old Medieval hospital at Beaune, with sketches of a number of its picturesque bits of architecture and detail, and headed by an elevation of the quaint street facade, with its little windows and long spaces of wall. "Comment on Construit un Guirassé" is a practical article on the process of building an iron-clad, with constructional sections, &c. Under the title "Coins du France" is another archaeological article, with sketches of architectural remains in the old French town of Vienne and its neighbourhood. An article on the Institute of France gives an account of the celebrated building facing the Pont des Arts, with illustrations of its architectural features, interior and exterior.

The *Gentleman's Magazine*, in an article on the "Birth and Growth of the Broad Gauge" (ostensibly a review of Mr. Sekon's "History of the Great Western Railway") puts together a good deal of information on the subject in an interesting manner.

The *Artist* contains a good deal of information and illustration of a miscellaneous character, with nothing that can be selected for special mention.

The *Windsor Magazine* contains an article on "The Art Treasures of Manchester," that is, the contents of the Manchester Art Gallery, with illustrations of a number of the principal pictures. The article is by Mr. Howarth, the Curator of the Mappin Art Gallery at Sheffield, who seems to regard pictures from a rather too moralising point of view.

St. Nicholas, a magazine "for young folks," deserves mention here for the good style of its illustrations as well as for the useful character of some of its articles. "Launching a Great Vessel" by Mr. Franklin Matthews, gives an account of a function which ought to be interesting to all children of a maritime nation. The two pages of silhouette studies of "Weekdays in Dolly's House" are excellent, and may serve children with lessons in drawing as well as amusement.

Punch Pictures, No. 26, includes a number of drawings by Leech and Doyle, and also one of the very best of Keen's military subjects, that of the Irish soldier who told the sergeant that "some of us ought to be in a menagerie." In comparison with some others in the book, the drawing seems a very simple one at first glance, but every detail in it is perfect.

The new interest taken in self-propelling carriages is already signalled by the appearance of a small monthly periodical, *The Auto-car*, devoted to this subject.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday, at the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Unification of London.—The greater part of the sitting was devoted to a discussion on the question of the unification of London. The Earl of Onslow moved the following resolution, which was seconded by Mr. Boulton:—

"That, inasmuch as it is desirable forthwith to take steps to facilitate the carrying into effect of the recommendation of the Royal Commission on the amalgamation of the City and County of London, that no duties should be thrown upon the central authority which can be equally well performed by

the local authorities, it be referred to the Local Government and Taxation Committee to arrange a conference between representatives of the Council and the Vestries and District Boards of the Metropolis to consider and report what powers now possessed by the Council should be transferred to the local authorities."

Mr. Hoare moved the following amendment which was seconded by Lord Farrer and ultimately agreed to by a majority of 14:—

"That the word 'recommendations' be substituted for the word 'recommendation' in line 2, and that the following words be inserted after the word 'London' in that line:—"one of which was."

A division on the amendment as a substantive motion then followed, with the following result:—For the motion, 73; against, 54.

Mr. Whitmore, M.P., on the same subject moved: "That Her Majesty's Government be requested to appoint a Commission to inquire and to report what changes should be made in the areas of local administration in the metropolis, so that the whole county of London shall be divided into districts governed by municipal councils; and that it be an instruction to the Commission in their delimitation of such districts to adhere to existing boundaries, and to regard local feeling and historic development so far as may be consistent with considerations of administrative convenience."

Lord Tweedmouth proposed the following amendment:—"That Her Majesty's Government be requested to introduce in the coming Session of Parliament, a Bill, providing, on the general lines of the Report of the recent Royal Commission, both for the amalgamation of the City and County of London and for the creation of Local Councils, so that the whole County of London shall be divided into districts governed by Councils, whose electoral areas shall follow existing boundaries and be determined with regard to local feeling and historic development, so far as may be consistent with considerations of administrative convenience."

After further discussion, the debate was adjourned until next week.

East London Water Supply.—The Parliamentary Committee reported:—

"The Council on November 20, 1894, referred back to us our report presented on that day with respect to the resolution of the Council on July 3, 1894, referring it to the Water and Parliamentary Committees to take such measures as they considered advisable with a view to obtaining legislation to raise the limit to which the East London Water Company is required to give a supply to a reasonable height of, say, 70 ft. from the nearest pavement. Having regard to the resolution of the Council to introduce a Bill last session for the purchase of this company's undertaking, we thought it then expedient to proceed simultaneously with a Bill for the object indicated, but we have now fully considered the matter, and have laid before us certain heads prepared by the agent upon the lines of which, as amended by us, we have instructed him to prepare a Bill. The resolution of the Council specifies a height of 70 ft. as that to which the company should be required to give a supply, but on full consideration we have thought it preferable that the company should be made subject to the provisions of the general law contained in Section 35 of the Waterworks Clauses Act, 1847, which requires that a supply of water shall be constantly laid on at such a pressure as may make the water reach the top story of the highest houses within the limits of supply. We have instructed the agent to draft the Bill and prepare the notices on these lines, and we will in due course submit the Bill to the Council for approval. We recommend that the instructions given to the agent as regards the drafting of the Bill and the preparation of the notices be approved."

Mr. B. Hope moved to refer the recommendation back to the Committee, but after some discussion the amendment was rejected and the report was agreed to.

Mill-lane, Deptford, Improvement Scheme.—On the recommendation of the Public Health and Housing Committee, it was agreed that the Council do retain the land acquired under the Mill-lane, Deptford, improvement scheme for the purpose of itself erecting the buildings for the accommodation of the number required under the scheme, and do make application to the Local Government Board for their consent to such a course being adopted; and that the Committee be authorised to employ an outside architect to design plans of dwellings to be erected on the Mill-lane, Deptford, area for the accommodation of not less than 570 persons, such dwellings to include a common lodging-house which shall accommodate not less than 200 persons, on the understanding that the Council is in no way pledged to the building of a lodging-house until

ails and particulars are submitted and approved by the Council.

Brooke's Market, Holborn, Improvement Scheme. It was also agreed, on the recommendation of the same committee, that, subject to the sanction of the Local Government Board, the Council itself erect the necessary dwellings on the area comprised in the Brooke's Market, Holborn, improvement scheme.

After transacting other business the Council adjourned.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—Annual conversation of this Society was held on the 1st inst. at the City Art Gallery, Mosley-street. The guests were received by the President, Mr. John Holden, F.R.I.B.A., among those who accepted the invitation to present were Sir E. Leader Williams, Dean of the Cathedral, Dr. Ward, Dr. Hodgkinson, Messrs. de Courcy Mead, W. Goldthorpe, Leo Lindon, Elias Bancroft, and others. A collection of architectural drawings was on view in the galleries; these were contributed chiefly by members of the society, and other architects in Manchester and the district—viz., Messrs. Rumford, J. Brooke, Booth & Chadwick, A. E. Hett, Darbyshire & Smith, F. W. Dixon, H. Dawson, Knill-Freeman, Goldsmith & Co., C. S. Haywood, E. Hewitt, J. Horsfall, Heathcote, Littlewoods, E. W. Leeson, H. A. Lear, F. W. Mee, Myresbeavers & Myres, W. J. Pen, F. H. Oldham, P. Silcock, M. Taylor, Addington & Son, Woodhouse & Willoughby, Harrington & Sons, Whitelegg & Whitaker, a number of interesting artistic trade exhibits had been sent by Mr. William Morris, London, J. P. Rathbone, Liverpool, Mr. Faulkner, Maitage, Bowdon, and Messrs. Waring, Heighly, Elkington, Doulton, Wragge, & Williams. The autumn exhibition of pictures and the permanent collection were on view in the upper series. An amateur orchestra gave a selection of music during the evening. The catering was the hands of Mr. R. J. Matthews.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—A lecture was delivered in the rooms of the Association, 187, Pitt-street, on Tuesday, by Malcolm Stark, I.A.A., on "Asylum Planning." The President (Mr. A. N. Paterson, I.A.A.) occupied the chair. After a few introductory remarks the lecturer said that there was no finality in asylum planning, and by means of diagrams illustrated the corridor and block plan. The former was favoured by the Commissioners of England, while the latter was favoured by the Commissioners of Scotland. The corridor plan was the serviceable for supervision by medical attendants, although it had disadvantages in its classification. Perhaps the principal point of its adoption by England was cost, the sums there being on a much larger scale than Scotland, and therefore requiring to economise. He then described in detail the several elements in an asylum building, and also the heating, ventilation, and drainage, noting particularly that there ought to be a plentiful supply of water, in case of fire, and that all the water should be stored. Architecturally, he thought that the buildings should be as much of a quiet nature as possible, and so take away the attention appearance. It was also desirable to have the decorations of each block different, so as to take away the monotony which would be apt to result to such an institution. At the close, a vote of thanks was passed to Mr. Stark for his able lecture.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—The second general meeting of the current year was held at the rooms of the Society on an evening last week. The President, Mr. J. Hemman, presided. After some preliminary business had been transacted, including the nomination of fourteen new members, the chairman addressed upon Mr. Percy Fitzgerald to deliver his treatise on "The Brothers Adam" and their work, illustrated by lantern-slides.

ARCHITECTURAL ASSOCIATION DISCUSSION.—The second meeting of the Discussion Committee of the Architectural Association was held in the rooms of the Association on Wednesday, November 6, at 7 p.m., when Mr. F. G. W. Buss read a paper entitled "Quantities from Four Different Points of View." It was followed by a very free discussion, in which Messrs. Nicholson, Fleming, Pywell, Weymouth, Sharpe, Hopkins, Stockdale, and Max Clarke took part. Messrs. Henry Holloway (of Holloway & Co.), and Tarring (of Perry & Co.), gave their

views of the matter from the builder's point of view.

Correspondence.

To the Editor of THE BUILDER.

RECVLVER CHURCH.

SIR,—In reference to the letters on Reculver Church and on "Pre-Conquest Architecture," in the current issue, I may mention that the remains of the so-called St. Pancras Church at Canterbury are to be seen in the ground where the Kent and Canterbury Hospital stands, a little to the east of that building. Except in one part there is nothing standing but a few courses of brickwork. The material is, however, Roman, and the workmanship very careful. This could be studied better a few years ago, before the tops of the walls were cemented over. Writing in the 14th century, William Thorne, a monk of St. Augustine's, within the precincts of which the building in question is situated, tells us that there had been a Pagan temple, or idol house "not far from the city, towards the east, as it were midway between the Church of St. Martin and the walls of the city," and that Augustine turned this into a church, dedicating it in the name of the martyr, St. Pancras. Whether or not Thorne is right about the early history of the building, there can be little doubt that what he knew as St. Pancras Church is the structure the remains of which we now call by that name. The indication he gives of the site, together with the character of the remains, is enough to convince even the rigid critics who refuse to identify the existing pre-conquest chapel at Bradford-on-Avon with the "ecclesia" said to have been built by Aldhelm, which William of Malmshury says existed there in his day.

The brickwork at St. Pancras is more regular and Roman-looking than anything to be seen at this day at Reculver, though the Roman origin of the famous columns which stood in the latter church is quite undoubted. Your correspondent, "F. G.," has evidently an interesting collection of drawings of Reculver, and I should be grateful if he would, some day, give me the chance of a sight of them.

G. BALDWIN BROWN.
University of Edinburgh, November 3.

THE NEW ARTIFICIAL STONE.

SIR,—Referring to the paragraph in your valuable paper of the 26th ult. upon this subject, in which reference is made to "Owen's Patent Artificial Stone," will you allow us, on behalf of our clients, The Sandstone Syndicate of London, Limited, to state that this new and valuable artificial stone is their property, and is covered by three patents dated May 1891, April 1893, and June 1894, and also that Owen's Patent is subsistent in date to the above, of which it appears to be an infringement.

MUNBY & LONGDEN,
Solicitors to the Company.
8, Old Jewry, London, E.C.,
November 5, 1895.

CHOLMONDELEY GRAMMAR SCHOOL.

SIR,—On a fine day it is thoroughly enjoyable to walk right across Hampstead Heath and up the Spaniard's-lane to the North-road in Higbygate, but as one approaches the Cholmondeley Grammar School there is an eyecore in view which detracts from the enjoyment. I speak of the brick slate-covered erection within the school grounds immediately in front of the principal elevation. I heard it said some time ago that this is only temporary. It is none the less an eyecore, and is getting dangerously old.

The building in question is hardly a public one, and it is not surprising, but it is grievous, to find governors as a body apparently as callous as many private owners.

The loving care which the late Mr. Fred. Pepys Cockerell bestowed on his work is known to all, and this work (one of the few of his in London and its vicinity) with its beautiful little chapel, testifies to this. I presume it is no secret that the late Mr. G. E. Street held it in high admiration.

HARRY SIRR.

OBITUARY.

MR. E. P. LOFTUS BROCK.—It is with great regret that we have to record the death of Mr. E. P. Loftus Brock, F.S.A., which took place on the 2nd inst. He had been suffering from cancer for the last nine months, and the end came rather suddenly. Mr. Loftus Brock was the son of Jas. L. Brock, and belonged to an old Guernsey family; his father was an old Peninsula officer, and served with the 6th and 8th regiments. Very early in life Mr. Brock showed a great predilection for art, and especially

the art of architecture. He studied at the Royal Academy Schools, where he gained a silver medal. Mr. Loftus Brock entered the offices of Messrs. W. L. & E. Habershon in 1851. He remained there until the two brothers severed their partnership, when he became Mr. E. Habershon's managing clerk. Having acquired partnership with his employer, the firm then known as E. Habershon & Brock carried on practice for many years, during which period Normanhurst Court, Battle, the seat of Lord Brassey, was erected for the late Mr. Brassey; also the rebuilding of One Place, and many new houses on the St. Helen's Estate, Hastings, a mansion at Bournemouth, a picture gallery at Baldstow, the Village Hospital, East Grinstead, Master's House at Harrow, for the Rev. Dr. Vaughan; the laying out of the Manor Estate, Wallington; Mr. Causton's Estate, Balham; the Custom House land for Mr. Brassey; estates at Kilburn, Godstone, Harrow, Teignmouth, Higbygate, &c., with most of the buildings and roads. A large number of churches were erected or restored, among them St. Augustine's, Higbygate New Park; Park Presbyterian Church, Higbygate; Hammerwood Church, Sussex; a church for Lady Lamson at Bowfont, Hethersgill Church, Cumberland; Wallington Church; St. Helen's, Old Sussex, where, by Mr. Brock's efforts, the ancient portions of the former church were allowed to remain as a ruin; St. Andrew's, Hastings; Ellacombe Church, Torquay; the remodelling of St. Saviour's, Hans-place, Chelsea; St. Paul's, Carlisle; St. John's, Cotehill, Cumberland; St. Paul's, Newbarns, Barrow-in-Furness; the rebuilding of the Church at Dallington, except its ancient spire, and of St. Mark's, Horsham, &c. The retirement of Mr. E. Habershon in 1879 the whole of the practice was left to Mr. Loftus Brock. Among the works carried out during this latter period may be mentioned the various homes of the National Refuges for Homeless and Destitute Children, including the remodelling of the old Manor House, Ealing, and the old mansion, Fortescue House, Twickenham, to adapt them for homes for boys and girls respectively, the new buildings at Sudbury Hall, the Bisley Industrial Home, and the Shaftesbury Home, near to it. The large block of buildings, Shaftesbury House, Shaftesbury-avenue (the foundation-stone of which was laid by the Prince of Wales), were erected for the same society. The German Orphanage, Dalston, and schools at Pentonville, Felbridge, Hastings, Newhaven, and the Missionary College, Palestine-place. He had built churches at Newhaven, Iping Marsh; St. Columbs, Notting Hill; St. Philip's, Cambridge; St. Matthias, Lincoln; St. Mark's, Forest Gate; and had repaired others at Westbere, Coldred, Staple, Runcle, Ruckinge, East Langdon, and Upton Hardres, all in Kent; Tollesbury, Essex; Preston Bissett, Bucks; and St. Mary's, West Kensington, has been remodelled; Iping Church, Newkenly rebuilt; a new chancel erected to St. Mark's, Horsham; the old ruin, St. Botolph's Colchester, strengthened; additions made to Broadwater Church, &c.; new rectories to Doding Church, Kent, and also to Llandilo Church, Carmarthenshire. Among general works were the enlargement of the Scottish Club, Dover-street; Granville Chambers, New Oxford-street; a new vicarage house at Kensington Park; St. Matthew's Hall, Bayswater; and additions to the Anchor Institute, Notting Hill Gate. After the death of Mr. Drayton Wyatt, Mr. Brock took in hand the various works at Sudeley Castle, Winchcombe, for Mrs. Dent, and superintended the excavation of the remains of Winchcombe Abbey, and succeeded in the recovery of a large portion of the ground plan of the church; quite recently, the Roman Villa in the Wadfield, near Sudeley Castle, has been unearthed, under Mr. Brock's direction. Mr. Brock was a man of great tact and skill, and could transform an old building at a comparatively small cost, and the same characteristics, added to his genial and courteous manner, often brought to a successful issue some of the most difficult complications with which an architect has to deal. During his long career, a large number of old churches came under his care, they were treated with tender and almost loving consideration, always striving to retain what was ancient and of real interest to the fabric, and yet leaving the work with a new lease of life, substantial and sound. He had of late years developed a form of timber church, chiefly used as mission churches, the pillars, the arcade, and the clearstory being all of timber construction, the outside walls only being of masonry or brick. The vista of the interior in some of these churches is very effective. The exterior elevations are mostly of the thirteenth-century style. For many years Mr. Brock held the office of Honorary Secretary to the British Archaeological Association, and latterly he was unanimously elected Treasurer. At the annual congresses of the Association he always took a most active part in the meetings, his knowledge on antiquarian subjects being most extensive. He was the author of a great many papers and essays dealing with antiquology. He was a Fellow of the Society of Antiquaries, and also of the Royal Institute of British Architects.

GENERAL BUILDING NEWS.

RESTORATION OF BUBWITH PARISH CHURCH, YORKSHIRE.—The parish church of All Saints, Bubwith, has just been restored, the work being

carried out by Mr. T. S. Ullathorne, contractor, of Selby, under the superintendence of Mr. J. Hodgson Fowler, architect to the Restoration Committee, and the late Mr. Ewan Christian, architect to the Ecclesiastical Commissioners. The ancient font, which was discarded by the previous restorers of the church, has been replaced in the sacred edifice.

ROYAL HOSPITAL FOR SICK CHILDREN, EDINBURGH.—The new hospital which has been built at Meadowside, Edinburgh, for the treatment of sick children has just been opened by Princess Beatrice. The site at Kilbank has a frontage to the south along Sciennes-road of 384 ft., a frontage to the west along Sylvan-place extending to 264 ft., and having access also from Rillbank-terrace, which forms part of the northern boundary. The block plan of the main hospital building is in the form of the letter E, the administrative block being in the centre of the building, and the wards in the two arms, cut off from the centre by disconnecting cross ventilated corridors. It is set with its open side towards the south, the administrative block running east and west, and the wards north and south. The administrative block is five stories in height, the two upper stories being in the roof; and the ward wings are three stories in height, the upper one being partly formed in the roof. The principal wards are upon the ground and first floors, those upon the third floor being spare, observation, and isolation wards. The kitchen, with its accompanying larders, milk-house, and stores, is placed upon the fourth floor, and the dormitories and bed-room accommodation for the domestic staff is upon the fifth floor or attic. The main entrance is from the south, in the centre of the administrative block, by a large entrance hall, across the end of which runs a 10-ft. wide corridor, extending right and left nearly the whole length of the building to the ward doors. Immediately to the right and left of the entrance-hall are the suites of rooms devoted to the matron and the resident doctors, while opposite the entrance-hall, in the centre of the administrative block to the north, is the surgical theatre, with a gallery to accommodate eighty-four students. To the right of this is the principal staircase, and to the left of the service stair, while beyond these, occupying the north-east and the north-west corners of the administrative block are rooms for the visiting physicians, one for each ward. At the end of the administrative block, the corridor is intersected by glazed screens. Play alcoves for the convalescent children of each ward are formed in bays to the south. Each of the four principal wards—that is, those upon the ground and first floors of the ward wings—is 84 ft. 6 in. long, 23 ft. wide, and 15 ft. high. They are arranged for twenty-four cots to each ward, which allows 81 superficial ft. of floor space and 1,215 cubic ft. of air space to each child. The total accommodation is 118 beds. The floor of the wards is laid with teak boards in narrow widths, and the walls are finished with parian cement polished to a perfectly hard and smooth surface. The angles of walls and ceilings are rounded, all ornamentation is excluded, and every precaution taken to avoid corners or ledges. In communication with each ward is a kitchen or pantry, while attached to each ward at the south end in the turrets, but dissected by a cross ventilated lobby, are a bath-room, a lavatory, a slop sink-room, and a water-closet. The general arrangement described above for the ground floor is repeated upon the first floor up, where the medical lecture theatre takes the place of the surgical one on the floor below, and the south range of rooms in the administrative block are devoted to the Board-room, museum, ophthalmic room, dispensary, assistants' room, matron's room, staff dining-room, and nurses' sitting-room. The wards in the wings are in every respect duplicates of those upon the ground-floor. On the second floor up the wards are sub-divided into observation, isolation, and spare wards, each with kitchen and lavatory accommodation as on the floors below. The front of the administrative block is devoted to a suite of bedrooms and sitting-rooms for the Sisters or Staff nurses, who have each charge of a ward, and to a sick-room for any members of the staff who may be invalided; while the north half of the administrative block and the northern end of the ward wings are devoted to bedrooms for the ordinary nursing staff. At this level the E-shape of the plan and the principal staircase terminates, and the central administrative block alone is carried up with the service stair. On the fourth floor are placed the kitchen, scullery, &c., and general stores to the north; and servants' hall, sewing and linen room, mattress room, &c., to the south. A hydraulic lift placed in the well of the service stair rises to this floor. The service stair terminates at this level, and a wooden stair leads to the attic above, where are the bedrooms and dormitories of the domestics. The dormitories are divided by wooden screen partitions into cubicles, but the whole of the nursing staff are provided with separate bedrooms. The building throughout is fitted with electric light generated by a duplicate set of boilers. Externally the building is of red sandstone from Corsehill Quarry. The design is based upon the English Renaissance of the sixteenth century. There are several adjuncts to the main building, such as the nurses' annex, with bedrooms for the night nursing staff, the mortuary and pathological rooms, the out-patients'

department, the laundry buildings, boiler-houses, engine-room, &c. The nurses' annex and the pathological blocks are in close proximity to the main building to which they are attached by covered corridors. The out-patients' department, laundry, and electric lighting buildings, are ranged along Sylvan-place, and are quite detached from the hospital proper. The entire building has been erected from the designs and under the personal superintendence of the architect, Mr. G. Washington Browne, A.R.S.A., and Mr. Winton has acted as clerk to the works. The buildings will cost about 40,000l. The contractor for the mason work was Mr. Hugh Mackintosh, and for the joiner work, Messrs. W. Beattie & Sons.

PATENT OFFICE EXTENSION.—Block III. of the Patent Office extension is fast approaching completion. The building is being erected for Her Majesty's Office of Works from the design of Mr. J. Taylor, C.B. Mr. B. E. Nightingale is the contractor. The floors and ceilings are fireproof throughout on the "Mark Fawcett" system.

NEW POLICE-STATION, LICHFIELD.—The police-station at Lichfield having become insufficient for present needs, a new police-station is to be shortly erected. The architect is Mr. John P. Osborne, of Birmingham.

CHURCH, PLEASLEY HILL, DERRYSHIRE.—The foundation stone has just been laid of the new St. Barnabas's Church, at Pleasley Hill. The cost of the new edifice, which is to be built by Mr. Adams, Eastwood, to the design of Messrs. Naylor & Sale, Derby, will not exceed 3,500l. It will be of red brick, both inside and out. At present it is proposed to erect a nave, aisle, and porch only, the whole to cost about 1,500l. When the church is completed there will be room for 350 people.

PARISH CHURCH, MILLBROOK, CORNWALL.—The consecration of a new parish church for Millbrook has just taken place. The foundation-stone was laid two years ago, and the building has been erected by Mr. Blowey, of Plymouth, from designs by Messrs. Hine & Odgers. The exterior is faced with Polypent and Bath stone, and in the interior are arches of similar material. The pulpit, by Reed, of Exeter, is of carved oak, illustrating "The True Vine." The church, capable of seating 800, is heated throughout with hot-water pipes, and contains a side chapel for smaller services. The organ has been reconstructed.

EXTENSION OF CITY HOSPITAL, ABERDEEN.—The extensive additions and alterations at this (infirmary diseases) hospital, belonging to the Town Council, have just been completed. The hospital is on the detached-pavilion system, and the administrative block is a separate building in the centre. Two of the four hospital pavilions have been enlarged to accommodate sixteen additional patients each. A mechanical heating and ventilating apparatus has been placed in the basement floor of the administrative block, which will under ground ducts from the pavilions lead. The warm air will be expelled by Blackman fans. In the ground floor of the administrative block as extended is a large kitchen. On the first floor over this kitchen is an extensive suite of nurses' bedrooms. The new block of offices measures 145 ft. 6 in. by 95 ft. 6 in. There is an open court in the centre. The new building contains a grand stable, ambulance-van house, lavatory, dirty and clean clothes-rooms, disinfected clothes' rooms, and boiler-house. On the first floor of the offices there are extensive drying and hay-lofts. There are also a new mortuary and a second gatekeeper's lodge. The extensions, including fittings, have cost upwards of 18,000l. The architect is Mr. John Clark, of Aberdeen.

WESLEYAN CHAPEL, BRADBUY, DURHAM.—On the 26th ult. the new Wesleyan Chapel at Bradbury was opened. The building in its finished state will accommodate about 360 persons, and will be capable of being divided by a movable partition into chapel and schoolroom. The walls are of brick, dressed trussed principals, finishing upon ornamental corbels, and is boarded throughout to the level of the collar. Boyle's ventilators are used in the roof, and the chapel is heated by a Musgrave stove, the school having an open fire-place. The seats and the whole of the interior woodwork are of pitch-pine. The work has been designed and carried out under the personal superintendence of Mr. Frank Martin, the draughtsman being as follows:—Builder and stater, Mr. J. G. Robson; carpenter and joiner, Mr. R. F. Snaith; ironfounder, Mr. J. Dobbing; plumber and glazier, Mr. Wm. Coates; painter, Mr. T. Metcalfe—all of Darlington.

BOARD SCHOOL, BRISTOL.—On the 1st inst. the new schools at Barton Hill, which have been built by the Bristol School Board, were opened. The new schools are as follows:—Builder and stater, Mr. J. G. Robson; carpenter and joiner, Mr. R. F. Snaith; ironfounder, Mr. J. Dobbing; plumber and glazier, Mr. Wm. Coates; painter, Mr. T. Metcalfe—all of Darlington.

STONE. The general plan is that of a large central hall, out of which the class-rooms lead. Upon the ground-floor are four class-rooms, the teachers' room, and the necessary offices, and the first-floor comprises four class-rooms, communication between which is afforded by a gallery. Mr. Bond having incorporated a decorated ceiling and two fireplaces which were part of Queen Anne's House, in the schools. Accommodation has been provided for 520 children, at a total cost of nearly 7,000l.

THEATRE, STRATFORD.—A new theatre is being erected in the High-street, Stratford. Mr. Frank Matcham is the architect. The pit will be 70 ft. wide and 70 ft. deep, and will hold about 1,500 people; and the stage will be 35 ft. wide by 45 ft. On the first floor the dress-circle will seat 200, the upper circle 500, and the gallery about 1,000. The house will be quite isolated. The total cost of the building will be about 23,000l.

RESTORATION OF KIDDERMINSTER PARISH CHURCH.—Kidderminster Parish Church has recently been restored. The restoration included the re-casing of the tower, and the restoration of the clearstories and of the west end of the nave, including new parapets. The stone gironing under the tower, which had been taken down years ago, has also been restored. The work has been executed from the plans of Mr. A. J. Chatwin, architect, of Birmingham.

PUBLIC HALL, STRATHAVEN, BANFFSHIRE.—A new public hall is in course of erection at Strathaven. The frontage of the hall to Kirk-street extends 49 ft., while the building runs along Thomson street for 100 ft. The main entrance is from Kirk-street. The area of the large hall will be seated for 500, and the gallery for 100. The platform will be of ample extent to accommodate large companies. On the ground-floor to the front there is an office, recreation-room with ladies' retiring-room, committee-rooms, &c. In the basement under the platform there is a large room, two retiring-rooms, kitchen, heating-room, and a store for seats. On the upper floor over the offices to Kirk-street, is the lesser hall, to be seated for 120, with an ante-room, and another large room, which will be suitable for reading-room and library. Mr. Alexander Cullen, architect, Motherwell, prepared the plans.

CONCERT-HALL, BLACKHEATH.—A new concert hall has just been opened at Blackheath. Messrs. J. Edmeston and G. Gabriel are the architects.

WESLEYAN CHAPEL, CARDIFF.—The opening services at the new Wesleyan Chapel, Ludlow street, Lower Grange, Cardiff, were held on Monday. The contractors were Messrs. E. Turner & Sons, and the architect Mr. Herbert Turner.

COTTAGE HOSPITAL, PORTH, GLAMORGANSHIRE.—The Porth Cottage Hospital was opened on Monday, by Mrs. George Thomas. The architect is Mr. F. Gibson, Pontypridd.

KIRK MEMORIAL EVANGELICAL UNION CHURCH, EDINBURGH.—The Kirk Memorial Evangelical Union Church, the foundation-stone of which has just been laid, is situated at East Montgomery-street, Edinburgh. It is designed in Early Perpendicular style, with nave and transept, projections. In the interior there will be a vestibule with paneled dividing screen, the seats are to be placed on either side, and the pulpit will be placed at the junction of the west transept and choir arches. The church is to be seated for 400, and the hall below will accommodate 200. Vestry, session house, and class-room accommodation is also provided for. The architect for the building is Mr. Hippolyte J. Blanc, A.R.S.A.

WESLEYAN CHAPEL, BIRKENHEAD.—A new Wesleyan chapel is to be erected at Birkenhead to take the place of Lowe-street Mission Room. The new building is to include accommodation for 300 people, with class-room, vestry, kitchen, &c. The walls are to be of grey local bricks with pressed brick dressings. The cost is estimated at 1,000l. exclusive of furnishing. The work will be carried out from the designs of Mr. T. Tallieson Rees, architect, of Birkenhead.

SCHOOLS, ASHTON-UPON-MERSEY, NEAR MANCHESTER.—The foundation-stone of the schools in connexion with St. Mary Magdalene's Church was laid on Saturday last. The architects for the schools are Messrs. Whitelegg & Whitaker, of Manchester. The building will be situated off Barker's-lane, and will accommodate 60 infants and 200 boys and girls in the mixed department. The infants' room will be 37 ft. 8 in. by 20 ft., and the mixed school is 57 ft. by 37 ft. 6 in.; the former is raised 3 ft. above the latter, and will form a platform with a proscenium opening 18 ft. wide by 12 ft. high for entertainments and parochial purposes, and the mixed school will form the auditorium. For school purposes the mixed department will be divided by movable glazed screens into four rooms which will accommodate 95, 33, 44, and 33 children respectively. There will be lavatories and cloakrooms for each department, two of which will be used as retiring-room for the performers at entertainments, and for the purpose are situated one on each side of the infants' school or stage. There will also be a cookery class room in the basement 20 ft. square, having its windows entirely above ground.

SANITARY AND ENGINEERING NEWS.—BUCKINGHAM SEWERAGE.—An inquiry was conducted at the Town Hall, Buckingham on the

ult, by Colonel C. H. Luard, R.E., one of the inspectors of the Local Government Board, into application by the Buckingham Town Council for action to borrow 9,050*l.* for works of sewerage disposal. A few years ago a scheme prepared by Mr. Baldwin Latham, C.E., to provide the sewage of the borough on a gravitation system, but the initial cost of this was too great, and authorities had no alternative but to select a trench system. Four engineers were selected to submit schemes, and that submitted by Mr. Bertram Nichols, C.E., of Birmingham, was adopted. Mr. Nichols' scheme, which he explained in detail before the Inspector, is one by which the effluent of the sewage of the borough is pumped on high ground within a short distance of the town, and a outfall-sewer will be 12 in. in diameter, and a gradient of 1 in 300, and a covered underground storage-tank is provided to contain the night-water. Three-throw pumps in duplicate will raise the effluent after it is screened, the motive-power being supplied by Hornsby-Akroyd oil-engines. A 6-in. cast-iron main will convey the sewage on to the land, where it will be chemically treated before precipitation in upward-flow circular "Candy" tanks. The effluent from the tanks will pass over 7 acres of land laid out for sewage filtration. The subsurface of a sandy nature. Some trial holes had been bored, and the Inspector upon visiting the site expressed himself as well satisfied with the outfall and the proposed treatment of the sewage. There was no opposition to the application, and the Corporation of Chorley have just commenced their new sewage purification works at Anson Bank Farm, at a cost of about 15,000*l.* Mr. Herbert Hibbert, C.E., the Chairman of the Corporation, performed the opening ceremony on Monday, October 28. The works have been designed by the Borough Engineer, Mr. William Leigh, A.M.Inst.C.E., and the whole has been carried out under his direction. The Corporation has provided tanks of a total capacity of 1,120,000 gallons, and polarite filters of a total area of about 20,000 square yards. The sludge pressing machinery has been supplied by Messrs. Loddard, Massey, & Co. These new works have been rendered necessary by the fact that the Chorley Sewage Farm failed in producing an effluent to satisfy the requirements of the river authorities. At the conclusion of the opening ceremony in the Town Hall, Mr. Nichols, Mr. Berley & Holt, Blackburn, speaking in response to the Mayor, "The Visitors," stated, as an engineer of forty years' experience, one who held a public office for many years, he was able to judge of the labour involved in carrying out of the kind they had seen opened that he had witnessed all the phases of the great sewage question, and the system of treatment adopted at Common Bank represented the last, the best, and the most complete development.

THE WREXHAM AND ELLESMERE RAILWAY.—Saturday last the Wrexham and Ellesmere Railway, which was begun in June, 1892, was opened for passenger and goods traffic. The new line runs through a picturesque district, and when the Wirral is completed will be a new thoroughfare between Liverpool, Manchester, and the north, and South Wales. The chief engineer of the line is Mr. George Owen, of Oswestry. Only a few miles of the line are laid at present, but all the viaducts and culverts are constructed to admit of the line being put down.

THE GREAT NORTHERN RAILWAY.—The Highland Railway Company have instructed their engineers (Messrs. Forman & McCall, Glasgow) to prepare the necessary Parliamentary plans and bills of a proposed extension of their railway from Fort-William to Ballachulish with a view to introducing a Bill in the ensuing session of Parliament.

DRAINAGE SCHEME, TICKHILL, YORKSHIRE.—Inquiry has just been held at Tickhill with respect to the borrowing of 2,500*l.* to carry out a scheme of drainage. The scheme had been prepared by Mr. Aird Murray, C.E., of Sheffield.

SANITARY CONDITION OF EXETER.—The City Council met on the 31st ult. to consider a report by Dr. Fletcher, medical officer of the Local Government Board, upon the sanitary condition of the city. Dr. Fletcher reported that regard to the water supply, the analyses of the water analysed varied considerably, and that there were times when the water could not be considered of good quality. He was also informed that the supply of water was taken from a well at Bramford Spoke, Thornton, Iwerston, Bampton. The report dealt *seriatim* with drainage and house drainage, ventilation of sewers, sewage outfalls, scavenging, house accommodation, slaughter houses, dairies, &c., and lodging houses, and sanitary administration.

With regard to house accommodation, he might fairly be described as good; but in the old city of Exeter, near the river, it had never been his lot to see in a comparatively small area so many dilapidated, ill-ventilated, badly-lighted, and filthy dwellings, as were to be found in that locality. Five properties were mentioned by name, and the fact stated that this whole area was over-crowded, and many of the houses were only fit for

demolition. House accommodation for the lowest of the working classes in Exeter might be said to be as bad as it could be. The Town Council had erred in allowing repairs where demolition was the only remedy. In his concluding remarks Dr. Fletcher said it was obvious that a considerable amount of good work had been done in the city of Exeter within recent years, that similar work was progressing at the present time, and that a large expenditure on main sewerage was contemplated in the near future. The Town Council were, moreover, anxious to increase the accommodation for patients at the isolation hospital, and to provide proper quarters for trained nurses. On the other hand, their method of dealing with dwelling-houses which were dilapidated, or unfit for habitation, had not been creditable. Condemned property had been bought by mere speculators for a very trifling amount, patched up, and again become inhabited. In dealing with such dwellings there had been, on the part of the Town Council, firstly, a want of energy, one might almost say apathy; and, secondly, a great want of firmness. With regard to the water supply, the Town Council should keep under careful inspection the River Exe and its tributaries, with a view to discovering all sources of pollution which might endanger the purity of the water supplied to the inhabitants of the city, and steps should be taken to prevent the continuance of such pollution. Special care should be taken to secure the efficient filtration of the water supplied for domestic purposes. The regulations for dairies, cowsheds, and milkshops, now in force, should be carefully revised, and amended with the assistance of the Medical Officer of Health, and the provisions therein contained should be strictly enforced. With a view to the more efficient sanitary administration of the district, the present by-laws with respect to (a) new streets and buildings; (b) slaughter-houses, should be revived under the advice and with the assistance of the Medical Officer of Health and Surveyor. In this revision the Town Council should bring them, as nearly as the special circumstances of their district will allow, into conformity with the model by-laws of the Local Government Board. The report was referred to the Sanitary Committee.

FOREIGN AND COLONIAL.

FRANCE.—M. d'Espouy has been elected Professor of Ornamental Design in the Architectural Section of the École des Beaux-Arts, in place of M. Ancelet, deceased. The jury on the open competition for the rebuilding of the Audit Office on the Quai d'Orsay has given their decision. There were twenty-one designs exhibited. The first premium has been awarded to M. Moyaux, Inspector-General of Civil Buildings, the second to M. Blavette, and the third to M. Marioud. The Committee of Management for the 1900 Exhibition have just adopted the programme relating to the two palaces which are to replace the Palais de l'Industrie. They are to be built on each side of the new avenue between the Invalides and the Avenue des Champs Élysées. It has been decided that there should be a single competition for the two palaces, but two distinct judgments. The architects will therefore be able to compete for the two palaces at the same time, or for one of the two. The programme of this competition, drawn up by M. Bouvard, will be submitted to the Municipal Council in a few days, and then to Parliament. Architects will be allowed three months after the Parliamentary decision. On Sunday last the new Hôtel de Ville at Engliem-Bains was inaugurated. It is a large stone and brick building, in the style of Louis XIII. It is surrounded by park. On the same day the new Mairie at Pecq was inaugurated. It is a graceful building, in a square, on the banks of the Seine, and opposite the Terrasse de Saint Germain. The Minister of Fine Arts has just given a grant to the town of Dijon, for the restoration of the Salle des Ducs de Bourgogne in the museum there. The Municipal Council has voted for the erection in Paris of a statue of Isaac Newton, to be paid for by international subscription. The sculptor, Emile Truffaut has just died in Paris at the age of fifty-two. He was a pupil of Duret and of Carpeaux. He received honourable mention in 1883, 1885, and 1886, a third medal in 1889, and a silver medal at the 1889 exhibition. We have also to announce the death of M. Aldrophe, a distinguished architect, and member of the Société Centrale. He is a built the synagogue in the Rue de la Victoire of which the *Builder* published a photograph some years ago. We shall give a special notice of him in our next letter from Paris.

AUSTRIA.—Two palaces of excellent design have been completed in connection with the rebuilding of the front of the Imperial "Hofburg" which faces the city. Herr Weyz is the sculptor of one of the fountains. There is much of his work in the new Museums and the Hofburg Theatre. A monument has been unveiled in memory of the late Mayor of Vienna, Dr. Prik. The monument is in the form of an obelisk with a bronze medallion showing a portrait of the deceased Mayor in semi-relief. Vienna will probably follow the example of Berlin in arranging a National Industrial Exhibition. Plans are being prepared for 1898, and we understand that the Government has promised to put a part of the Prater Park, with the old "Rotunda" of

the Vienna International Exhibition, at the disposal of the influential committee that has the matter in hand. The exhibition of tombstones has now been opened at Bruenn, and shows some excellent sculptural works as well as some good wrought-iron designs. A number of prominent Vienna sculptors have sent models. The Vienna Central Churchyard is well known for its elaborate monuments. The historical section of the exhibition should have been more complete. The example of holding an exhibition of this kind might be followed in London where the ugly stock tombstone is all too common.

MISCELLANEOUS.

THE CARE OF OUR NATIONAL MONUMENTS.—The *Daily Chronicle*, in commenting a few days ago on the dangerous condition of the spire of Salisbury Cathedral, concluded its remarks as follows:—"It is simply a scandal and a disgrace that the care of our great national monuments, the cathedrals of England, should not be in the hands of a properly-qualified Government official, whose duty it should be, intelligently and continuously, to inspect them, instead of their being left, as at present, until they threaten to collapse, and then depending upon a paltry private subscription to patch them up temporarily."

ELECTRIC LIGHT FOR THE CANCER HOSPITAL, BROMPTON.—The Committee of the Cancer Hospital, Brompton, have decided to introduce the electric light throughout the hospital premises, and have instructed Mr. Morgan Williams, C.E., to prepare specifications for the work.

THE BLACKWALL TUNNEL.—Many thousands of persons have recently visited Blackwall Tunnel. All who enter pay 3*d.* each for the benefit of the Poplar Hospital. On Saturday last week friendly societies, with bands, banners, and regalia were early astir, and from ten onwards a stream of sightseers descended the cylinders to view the tunnel. At little distances along the tunnel models, showing how the boring was done, and the different stages of the enterprise, attracted much attention. Already houses are rising on the Greenwich marshes, for the building trade has received a mighty fillip by the making of this new link between north and south.—*Daily Chronicle*.

THE STRAND EXPLOSION.—Mr. Troutbeck, the Westminster Coroner, opened an inquiry on the 4th inst., at St. Clement Dane's Vestry Hall, concerning the death of Martin Ernest Spargler, twenty-six, a fourth-class fireman in the Metropolitan Fire Brigade, who was killed by the collapse of some house property after an explosion in New Church Street, Strand, on October 29. Mr. Glenn explained that Sir John Hutton was the freeholder of No. 26 and the leaseholder of No. 27, and both the houses were sublet by him on repairing leases. Sir John wished to express his deep regret at the sad calamity, and to afford every assistance in the inquiry. The Gas Light and Coke Company and the New River Company were also represented. In the course of the evidence, Mr. W. G. Perkins, surveyor of the Architects' Department of the London County Council, produced a plan of the remains of the building. He said the width of the walls was 14 in., and they were composed of placed bricks, that was bricks that had not been properly burned and were porous; the mortar was quite rotten, and had no adhesive qualities whatever. The houses in the court were about one hundred years old. Thomas Hawkins, a builder, of Judd-street, Brunswick-square, stated that about two years ago, in accordance with the instructions of Mr. Collard, architect to the owner of the property (Sir John Hutton), he put the house into repair according to a specification. He then took the houses over under an agreement, and let them out. In reply to Mr. Glenn, witness said that the cost of repairing the two houses was 244*l.* He was paid that amount, and then took over the houses. They were then in a good habitable state of repair. He saw the houses a fortnight ago, and he did not notice any smell of gas. The inquiry was adjourned for a fortnight.

SANITARY INSPECTORS' EXAMINATION, ABERDEEN.—An examination for persons qualifying for the office of Sanitary Inspector has just been held in Marischal College, Aberdeen, under the auspices of the Sanitary Association of Scotland. There were nine candidates. The examiners were Dr. Nasmyth, Fife; Dr. Macvaal, Dumbarton; Mr. Mathison, Burgh Engineer, Dundee; and Mr. Allan, Burgh Surveyor, Govan.

CAIRO AT BERLIN.—At the Industrial Exhibition at Berlin next year there is to be a reproduction of Cairo, or a portion of it, under the superintendence of a Berlin architect, Herr Wolgemuth. The Berlin Cairo is to greatly surpass the Paris Cairo of 1889 in extent and pretension. It is to include the mosque of Kail Bay and tombs of the Caliphs, not to speak of a colossal Sphinx, "a prosperous village of felahs," and the engagement of 400 Arabs to take part in the pageants and spectacles.

PROFESSOR H. ADAMS ON WIND PRESSURE.—On October 30, at the first meeting for the session of the City of London College Science Society, Professor Henry Adams, M.Inst.C.E., one of the Vice-Presidents, read a paper on "The Force of the Wind." After reviewing a number of the recorded experiments on wind pressure, he tabulated

the results upon a common basis to show that within certain limits the intensity of the pressure increased with the area of the receiving surface, but over large areas the maximum was not reached in practice owing to the wind moving in concentrated gusts. An account was given of the pressure said to have been reached in various historical gales, and extracts from various standard works as to the proper pressure to be estimated for in designing structures. In conclusion he suggested that, although 56 lbs. per square foot might be looked upon as the standard, this should be modified according to the circumstances of the case, viz., with the height from ground level, the unsupported width and the angle of incidence. The pressure according to the table submitted varied from 10 lbs. at ground level to 80 lbs. at a height of 200 ft., and in the latter case from 80 lbs. at a width of 10 ft. to 40 lbs. at a width of 1,000 ft., while the multiplier for angle varied from .45 at 5 deg. to 1.00 at 60 to 90 deg.

THE COMMISSIONERS OF SEWERS.—A statement of a serious character was made by Dr. Sedgwick Saunders, the Medical Officer of Health to the City, to the Commissioners of Sewers, at the meeting held on Tuesday. He said no provision existed in the City for the isolation of persons suffering from infectious diseases. In some cases, patients were not removed until they were in a moribund condition. In subsequently replying to a statement by Mr. Deputy White as to the obligation of the Commissioners to provide the necessary accommodation, the Medical Officer of Health said the Commission being the Local Authority, they were bound to provide a hospital for the treatment of such cases, instancing the case of Eastbourne, which had recently done so. The Medical Officer having repeated that employers were morally bound to make some accommodation for their employees in case of need, the matter was referred to the Sanitary Committee.

ANTIQUEARIAN DISCOVERIES, CAMBRIDGE.—Some antiquarian discoveries have recently been made in connexion with the sewerage operations in Jesus-lane. About 8 ft. below the surface of the road, near the gate of Jesus College, seven fairly complete skeletons were found. Fragments both of Saxon and Roman pottery have been found in this cutting, as well as large quantities of masonry. The masonry was found about 4 ft. below the surface of the road.

MEMORIAL PILLAR, CROWTHORNE, BERKSHIRE.—A memorial has just been placed over the remains of the late wife of Mr. H. G. Armstrong, of Heathcote, Wellington College, in the graveyard of the church of St. John Baptist at Crowthorne. The pillar is a monolith of grey granite. It assumes the form of a "four-holed" west-country cross, moulded upon the upper part. Messrs. Harry Hems & Sons, of Exeter, carried out the work.

ALTAR, CHRIST CHURCH, WORTHING.—The new altar at Christ Church, Worthing, is of Early English character, designed by Mr. E. Singer Hyde, architect, of Worthing. Its length is 7 ft., and in height and width it is 3 ft. It is made of English oak. Upon the upper face of the table are inscribed the five consecration crosses. The front, facing west, is divided into three distinct compartments. The work has been carried out by Messrs. Harry Hems & Sons, of Exeter.

THE ARTISTS' GUILD.—On the 4th inst. Princess Christian opened, at the Royal Albert Hall, the Seventh Annual Amateur Art Exhibition of the Artists' Guild. The articles exhibited include embroidery, painting, photography, wood-carving, leather work, and work in metals.

ARTS AND CRAFTS EXHIBITION, DUBLIN.—An Arts and Crafts Exhibition, Dublin, will be held at the Royal University Buildings on the 26th inst. The fundamental object of the exhibition is to stimulate and encourage native skill.

PULPIT, ALL SAINTS' CHURCH, FALMOUTH.—The new pulpit in All Saints' Church, Falmouth, has just been dedicated. Standing on a stone platform, the pulpit, with its circular front, is supported by a large Devon green marble shaft, surrounded by seven different coloured marble shafts, some twisted, others octagonal and circular. The body is formed of Derbyshire alabaster, inlaid with slabs of Devon marble of different shades, while the circular front has a floriated cross of white marble on a background of red marble. On either side are two figures, St. George and St. Piran, carved in Italian white alabaster. Messrs. J. and E. Goad, of Plymouth Phoenix Marble Works, have executed the work to the plans of Mr. Sedding (Plymouth). **EPPING FOREST MUSEUM.**—The Essex Field Club have just established the Epping Forest free local Museum, which was opened on Saturday last. The museum is situated at the Queen Elizabeth's hunting-lodge, adjoining the Forest Hotel at Chingford. The museum is designed and arranged to illustrate the natural history, archaeology, and history of the district. Mr. William Cole is the honorary curator. On the walls of the ancient staircase are maps and views, geological sections, and plans of the Forest.

NATIONAL REGISTRATION OF PLUMBERS.—An examination of master and operative plumbers was held on Saturday last at the Borough-road Polytechnic. Candidates were present from various parts of London and the provinces. The examiners

were Mr. Charles Hudson, chairman; Messrs. J. Hume and S. Stalder, master plumbers; Messrs. D. Early, W. J. Jarvis, and T. Nicholson, representatives of the operatives; and Mr. C. T. Mills, superintendent of the trade classes. Fourteen per cent. of the masters and eighteen of the operatives passed in practical work.

THE CORDWAINERS COMPANY.—At the Court of the Worshipful Company of Cordwainers held on the 6th inst. at their Hall in Cannon-street, Mr. Howard Chatfield Clarke was appointed Surveyor to the Company.

LONDON WATER-SUPPLY.—Colonel Ducat, R.E., opened an inquiry on the 31st ult., at the Guildhall, Westminster, on behalf of the Local Government Board, into the supply of water for sanitary purposes in the metropolis. The inquiry was the outcome of a report presented to the London County Council a year ago by its Public Health and Housing Committee, which stated that the by-laws of the eight water companies who supplied the metropolitan area should be amended, so as to give a greater supply of water for sanitary purposes. Acting on this report, the Council had asked the companies to comply with its recommendations. This they had refused to do, and hence the present inquiry. Mr. F. M. Freeman represented the County Council; and Mr. Penber, Q.C., Mr. C. A. Cripps, Q.C., M.P., and Mr. Richards the eight associated water companies. Mr. Freeman, in opening the case for the County Council, gave an account of the Acts which at present governed the Metropolitan water supply, and said that under the Act of 1871 the County Council, as the central authority, was empowered to make certain demands on the companies. If these demands were not complied with, the Council had power to ask for a Government inquiry. The present regulations were drawn up in 1872, and had become defective as far as sanitary requirements were concerned, for very considerable advances had been made in sanitation generally, and regulations which might have been perfectly adequate twenty-three years ago, had now become altogether inadequate. The matter was brought before the Council by the Vestry of St. Giles in 1892. Communications had since been received from almost every Vestry and Board of Works in the Metropolis, all endorsing the view that the present flush of water for closets was inadequate. This view had been endorsed by the Medical Officer, the Engineer, and the Superintendent Architect of the County Council, who would all be called as witnesses. The companies had demurred to the carrying out of the Council's demands on the ground of expense. He (Mr. Freeman) thought their fears were exaggerated, but it was only reasonable and proper that they should be called upon to make such alterations as were consistent with the health of the people and the sanitary experience of the time. Mr. C. F. Doll, architect and surveyor to St. Giles's Board of Works, examined by Mr. Freeman, said that the present flush of two gallons was inadequate, and should be increased to three.

Mr. W. J. Berry, surveyor of the Estates and Valuation Department of the Council, said he had charge of the artisans' dwellings erected by the Council. He compared blocks of buildings where there were two-gallon cisterns with those where there were three-gallon cisterns. In Valsby-street, Poplar, they had a block of buildings belonging to the first class, and in Brook-street, Ratcliff, another belonging to the second. The fittings were the same in each case. In the first case they had been called to attend twenty-one blocks of closets during the past seven months. During the past twelve months there had not been a single similar complaint from the Brook-street buildings. Dr. Sykes, medical officer of health for the parish of St. Pancras, did not consider that the two-gallon flow, at present given by the water companies, was sufficient. A three-gallon flush would be beneficial in clearing the closet, the trap, and the drain. There would be an actual saving of water with a three-gallon flush, because instead of closets being flushed twice, one flushing would suffice. Cross-examined by Mr. Penber: The imperfection of the flush was due to the want of water, and not to imperfection of fittings. The regulations laid down by the water companies might prevent waste of water, but it was at the expense of the health of the public. He had no statistics to prove this last statement. Mr. Samuel Buck and Mr. P. Lebran, London County Council Superintendents, corroborated Mr. Berry's statements. Mr. Bunt, Chief Engineer to the Council, examined by Mr. Freeman, said he was of opinion that for the protection of public health it was absolutely necessary that cisterns having a capacity of three gallons should be provided in every closet. Cross-examined by Mr. Penber: He was not aware of more than three towns in which this was the case. Nevertheless, he was strongly of opinion that it was necessary for health. The inquiry was adjourned until the following day, when additional witnesses were called on behalf of the Council. Dr. Murphy, Medical Officer of Health for the Administrative County of London, considered three gallons essential; Mr. William Groom, sanitary inspector to the Camberwell Vestry, thought two gallons insufficient, and said the

defective supply had caused great inconvenience, his district; Mr. T. Blashill, Superintendent Architect of the Council; Mr. K. Young, C.E.; Mr. J. W. Clark, Liverrman of the Company of Plumbers and Member of the Sanitary Institute; and Mr. T. A. Field, Member of the Council of Civil Engineers at that of the Sanitary Institute, also gave evidence in support of the proposed increase of water supply for sanitary purposes in private dwellings. The inquiry was adjourned until Monday, when Dr. Parkes, Medical Officer of Health for Chelsea and Professor Henry Robinson, Professor of Civil Engineering at King's College, London, both expressed the opinion that the existing flush of two gallons was insufficient. Mr. Edward M. Eton, C.E., Chief Engineer to the Sheffield Waterworks was the first witness called for the water companies. He asserted that in that town a flush of two gallons was deemed quite adequate. There had been complaints, but none of them were proper attributable to deficient flush. The increase proposed by the London County Council would involve a heavy charge on the water companies. Mr. Ernest Collins, M.Inst.C.E., and Engineer to the New River Company, said he had been connected with that company for fifteen years, that the company's water rental was derived from 160,000 houses, and that he considered the two gallons sufficient if properly discharged. He suggested that the bath waste might be utilised, and proper precautions, for flushing and sanitary purposes. If the sanitary authorities had seen better to the fittings, he thought this inquiry would not have arisen. The existing three-gallon flushes were comparatively few. The effect of an enforced increase of flush, as proposed by the London County Council, would be to entail on the New River Company an additional supply of 3,400,000 gallons per day, and on the London Water Companies as a whole an increase of about 12,000,000 gallons per day. He thought that was a very moderate computation. He was of opinion that the whole of this controversy was about through the use of improper fittings, not only in design but in manufacture; and that the water companies, for the protection of themselves and the public, ought to have regulations which would enable them to examine and test the fittings. A great many of the provincial towns had had powers, and the water companies ought to have them in London. They ought to have a revision of the whole regulations, not only as regarded the two-gallon flush, but in other ways, so that the fittings which were generally put up at the cheapest rates might be brought under proper control. Cross-examined by Mr. Freeman, the witness said he had not in terms suggested to the companies that application should be made for such powers, but had put it in a form that their regulations ought to be strengthened. The inquiry was again adjourned.

CAPITAL AND LABOUR.

SUB-CONTRACTING AND GOVERNMENT CONTRACTS.—Mr. Joseph Verdon and Mr. D. Hensell have had an interview with Mr. Akers-Douglas, First Commissioner of Works, on behalf of the London Building Trades' Federation, with reference to the question of sub-contracting on Government contracts. It was pointed out to the First Commissioner that certain firms were getting their work done by sub-contractors under the guise of foremen and he, he, we understand, agreed to insert a clause in the contracts requiring the contractor to provide competent foremen, who shall be in exclusive employ, to superintend the execution of the works on his behalf, and no charge shall be allowed for this, either in measured or day-work. **GLASGOW BUILDING TRADES' EXCHANGE.** The annual general meeting in connexion with the Building Trades' Exchange of the City of Glasgow, Limited, was held on the 5th ult., in the rooms, 30, Gordon-street.—Colonel R. Bennett presiding. The Secretary (Mr. Cook) submitted the annual report. The Exchange had been in existence, it stated, for eighteen months. Its shareholders now numbered seventy, holding among them 80 shares. During the year 1905 subscribers had joined, making a total of 248. The rooms had been largely taken advantage of by the various masters' associations for meetings, over eight having been held during the twelve months. September 30. The trades represented were painters, plasterers, slaters, brickbuilders, plumbers, glaziers, and the Institute of Measurers. So September 30, meetings had been on the increase. A joint committee had been engaged in promoting a scheme of monthly meetings of the whole Exchange, when papers on subjects of interest to the trades may be read by members and discussed. By this means the chief object of the Exchange, viz., to promote the best interests of the building trades—would be forwarded. The same joint committee had also been considering a scheme for the formation of a library in the Exchange, which should contain, as far as possible, the complete catalogues of all the principal manufacturers of goods or material pertaining in any way to the building trades. The Arbitration Committee had not been unduly called upon to exercise their functions. The Chairman, in moving the adoption of the report, said the Exchange had

justified its existence. During the year they had been so far successful in bringing together a large number of the best tradesmen in Glasgow, thus enabling them to meet often as friends, and reducing the friction which naturally arose through the various trades. Through the medium of the Exchange they had done more in the way of conciliation than could have been done in any other town in the country. Ex-Councillor John Paterson had been elected to the office, and the committee, the retiring members of the Executive Council—Sir William Arrol, M.P., Colonel R. J. Bennett, Messrs. Andrew Gray, James Brand, James Goldie, Matthew Henderson, and John Porter—were re-elected, and Messrs. Paterson and Benzie were appointed auditors. A vote of thanks having been passed to the Chairman, the meeting separated.

CROYDON AND DISTRICT MASTER BUILDERS' ASSOCIATION.—The members of this Association held their annual meeting on the 1st inst. The committee reported that in the early part of this year the Carpenters and Joiners' Societies gave notice of their intention to enforce the London Labour Trades Federation rules. Subsequently a strike ensued, and picketing had been resorted to on the principal works throughout the town, with but little inconvenience to the trade generally. The strike was now practically at an end, having failed in its object. The meeting then proceeded to elect officers and committee for the ensuing year. Mr. M. Taylor, C.C., was elected Chairman, Mr. S. Page, Vice-President, and a committee of twelve. It was also arranged that the annual dinner should be held early in the new year.

LEGAL.

BUILDING CASE IN THE QUEEN'S BENCH DIVISION.

THE CASE of *Macrory v. Gibbon* came before Mr. Justice Wright, sitting without a jury, on the 1st inst., it being an action brought by Mr. Edmund Macrory, Q.C., the owner of a leasehold house, No. 2, Ilchester Gardens, W., against the defendant, Mr. Henry Gibbon, the owner of a block of residential flats in Moscow-road, W., for the alleged breach of an agreement.

It appeared that the plaintiff purchased his house in Ilchester Gardens in 1872, and lived there until four years ago, since which it had been to let. When the house was bought, and down to within the last year or two, there were only small cottages in the Moscow-road, and although the kitchen, which was at the back, was always dark, the buildings in the Moscow-road in no way affected the light of the plaintiff's back premises. The defendant, the lease of the cottages having fallen in, purchased the land and commenced building the flats in question. Mr. Macrory and a neighbour, Mr. Heath, when they discovered that a part of one new building came close up at the back as seriously to interfere with their light and air, entered into a correspondence with the defendant, alleging that he was encroaching on their rights. The defendant denied that, but, as a compromise, an agreement was finally entered into between the plaintiff, Mr. Heath, and the defendant, on September 12, 1891, whereby it was agreed that the new buildings, which by that time had been got on with a good way, should be confined. By the agreement the defendant undertook not to build in such a way as to prevent the plaintiff, if he thought proper, opening windows overlooking the defendant's premises. The plaintiff considered that this gave him a right to open a new window in the kitchen, which he had long intended to do, overlooking the defendant's area or well, which owing to the way the building had been erected, it was found could not now be done. The defendant contended that having regard to the height of the buildings at the time, such a construction could not be placed on the agreement, and also that there was no agreement at all on his part that the "well" should be open from the ground, and, further, that the buildings were exactly in accordance with plans that had been shown to the plaintiff's solicitor when the agreement was made. His Lordship remarked, in the course of the arguments of counsel, that, supposing the defendant to be true to the construction of the agreement was that contended for by the plaintiff, he failed to see in what better position he would be. He (his Lordship) could only order a peremptory *mandamus* to pull down the projecting part of the building or give damages, and he doubted any damages he could give would compensate the plaintiff.

Mr. Bucknill, Q.C., who appeared with Mr. Manisty, for the plaintiff, said that the mischief had been done, and he was afraid it was hopeless to suggest that the defendant should buy the house, as terms could not be agreed upon.

Mr. Alfred Cock, Q.C., who appeared with Mr. Manisty, for the defendant, said that if his Lordship decided the case against his client he would rather pull down than go to the expense of an inquiry as to depreciation.

The learned Judge ultimately gave judgment for the plaintiff, holding that the true construction of the agreement was that contended for by him, and the consent of all parties his Lordship directed that that part of the building in dispute should be pulled down within three months unless an appeal

were entered within the usual time, when the order should stand over pending the judgment of the Court of Appeal.

APPEAL CASE UNDER THE BUILDING ACT.

At the Westminster Police-court on Friday in last week Mr. de Rutzen gave his decision on an appeal under Section 150 of the Building Act of 1894 against a notice of objection given by Mr. E. Drury, District Surveyor, St. Margaret and St. John the Evangelist, Westminster, as to a wall in course of erection by builders for the Army and Navy Auxiliary Stores for the extension of their premises in Coburg-row, Westminster. The question involved was as to whether the wall could be, for some part of its height, a party-wall, and as to the remainder an external wall. On the result the right of making certain openings depended.

Mr. T. Seager Barry argued the case for the London County Council, and Mr. R. Cunningham Glen for the Auxiliary Stores.

Mr. de Rutzen decided the case in favour of the appellants, the Auxiliary Stores.

Mr. Seager Barry said that probably the County Council would appeal on a case stated. The magistrate, however, had no wish to discourage an appeal, but as that would add to the expense he would allow appellants twenty guineas costs.

THE STRAND EXPLOSION.

On Friday last week, at Bow-street, the owners of Nos. 25, 26, and 27, New Church-court, Strand, were summoned by the London County Council to show cause why they should not pull down those portions of their premises now standing.

Mr. Chilvers, who appeared on behalf of the Council, explained that the houses in question were those affected by the recent explosion. The men declined to shure up the adjoining property until the rotten walls had been demolished.

Mr. Frederick William Porter, District Surveyor of St. Mary-le-Strand, stated that the workmen commenced operations on the morning following the explosion, but it was found impossible to shure up whilst the damaged walls were standing. It was impossible to repair either of the houses. The safest course was to pull them down.

Mr. Barnett said his client offered no objection, and the magistrate made an order calling upon the owner to pull down the building forthwith.

A QUESTION OF DRAINAGE.

At the Lambeth Police-court on Monday, Mr. Hopkins delivered judgment in a case of considerable interest to parochial authorities. The Vestry of St. Mary, Newington, were summoned by Mr. Harry Richardson, of Finsbury-square, for neglecting to repair and amend a certain sewer, draining several houses in Gurney-street, Newington.

Mr. Blanchensee appeared in support of the summons, and Mr. Moreton Smith represented the Vestry.

The complainant is the leaseholder of the houses in question, which are drained by a combined operation, several houses being served by the same pipe connexion with the sewer in the roadway. It was contended on behalf of the complainant that this being a combined drain—to the construction of which the consent of the Local Authority had never been given—the Vestry were, under recent decisions, liable for its repair. These proceedings were taken under Section 12 of the Public Health (London) Act, 1891.

On behalf of the Vestry, Mr. Moreton Smith contended that the onus of showing that the drain was constructed illegally—that was to say, without the consent of the Local Authority—was upon the complainant. He also submitted that the Vestry could not be proceeded against under this section of the Act, and remarked that since the decision in the case of *Kershaw v. Taylor*, owners of this class of property had been trying to take advantage of the decision by throwing the onus of putting their property in a proper state upon the Vestry.

Mr. Hopkins observed that the first question which arose in the case was whether or not this was a sewer or whether it was only a drain. Looking at the pipe itself, quite apart from any question arising under the statutes, he came to the conclusion that this was a sewer common to all the houses. It might be shown, if certain things could be proved, that this pipe instead of being a sewer was a drain in consequence of the arrangements made with the owner of the property at the time the pipe was laid. None of these things had been proved, and the question was whose business was it to prove it? He thought the onus was upon the Vestry, who had all the papers relating to the matter under their control, and who ought to be able to show whether certain consents were given. There was another point in the case that had given him a great deal of trouble—the point that the Public Health Act, 1891, provides no machinery by which the Sanitary Authority can be compelled to keep their sewers in order. He had searched the Act through without being able to discover any sort of machinery which compelled the Vestry to keep their sewers in order. The whole of the statute, from beginning to end, looked upon the Vestry as the com-

plaintains. There was no process short of indictment by which the Vestry, upon whom, so far as he understood the statute, the burden of keeping this pipe in repair fell, could be compelled to repair its sewers. He did not think he could make any order under this statute to compel the Vestry to repair this pipe, and the summons would therefore be dismissed.

His Worship declined to allow the Vestry costs as against the complainant, remarking that upon the facts he was against them.

BUILDING BY-LAWS, BARRY.

At Barry Police-court on Monday, says the *Western Mail* (before Major-General Lee and Mr. Lowdon) the Barry Urban District Council charged Mr. James Price, baker and confectioner, Holton-road, Barry Dock, with an infringement of the by-laws of the Council. Mr. J. Arthur Hughes, Cadoston, the Clerk and Solicitor to the District Council, appeared for the prosecution, and Mr. George David, solicitor, Cardiff, defended.

Mr. Hughes explained that the proceedings were taken under By-law 54 of the Public Health Act, in which it was stated there should be a clear space of not less than 15 ft. at the back of a building 25 ft. high. In March, 1894, plans were sent in by Mr. Price of stables to be erected at the back of his premises. These were, however, amended, to provide for a portion of the building then erected being set back, so as to allow the required 15 ft. lateral area. Mr. Price had also signed the plan agreeing to carry out this work. No summons was taken up by the Council when the stable was being erected, because they relied upon Mr. Price's promise.

For the defence, Mr. David maintained that the case was not proved, because the original plan was not produced.

Mr. Hughes pointed out, in reply, that two plans were sent to the council, one being kept and the other sent back to the builder.

Mr. J. C. Pardoe, surveyor, and Mr. W. Wakeham, building inspector, were examined, the former proving that the lateral space in question was two feet less than the law required.

Mr. David contended that there was no case against his client, inasmuch as proceedings had not been taken within six months, as required by the Act. Mr. Hughes replied that he could prove that the building had not been finished in May last.

The Bench upheld the point raised by Mr. David, and dismissed the summons, but, consented, on the application of Mr. Hughes, to state a case, the latter remarking that the Council considered the point an important one, and desired to have it fully cleared up.—The Barry District Council have also summoned Mr. J. P. Harding, builder, Barry, for infringement of by-laws by allowing certain houses in Holton-street and Prince-street to be occupied without having the same certified by the surveyor as fit for occupation; and Mr. B. Hoddinott, Witches Hotel, Cadoston, was charged with neglecting to fence in a quarry, his property, off Barry-road. Mr. J. A. Hughes appeared for the prosecution in both cases, and Harding was fined 20s. and costs, and Hoddinott ordered to carry out the work and pay the costs.

MEETINGS.

FRIDAY, NOVEMBER 8.

Architectural Association.—Mr. Talford Ely, M.A., on "Pompeii"—with lantern illustrations. 7.30 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Professor T. Roger Smith on "Sanitary Building Construction." 8 p.m.

SATURDAY, NOVEMBER 9.

Sanitary Institute (Lectures for Sanitary Officers).—Visit to the Sewage and Destructor Works, Ealing. 2.15 p.m.

MONDAY, NOVEMBER 11.

Surveyors' Institution.—The President, Mr. Daniel Wainey, will deliver an Opening Address. 8 p.m.
Clerks of Works Association (Carpenters' Hall).—Paper by Mr. H. J. Harding. 7.30 p.m.
Liverpool Architectural Society.—Mr. R. Anning Bell on "The Training of Workers in the Applied Arts." 6.30 p.m.

TUESDAY, NOVEMBER 12.

Institution of Civil Engineers.—Address by Sir Benjamin Baker, K.C.M.G., the President, and Presentation of Medals, Premiums, and Prizes awarded at the close of last Session. 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.
Carliste Architectural, Engineering, and Surveying Society.—Mr. C. Lowndes on "Chippendale, Heppelwhite, and Sheraton." 8 p.m.

WEDNESDAY, NOVEMBER 13.

Architectural Association Camera Club.—Mr. C. H. Freeman on "Canterbury Cathedral," illustrated by lantern views. 8 p.m.
Carpenters' Hall, London Wall (Lectures on Building and Sanitary Construction).—Professor Banister Fletcher on "Sanitary Construction." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Inspection of the L.C.C. Common Lodging-House, Parker-street, Drury-lane. 3 p.m.
Liverpool Engineering Society.—Mr. W. G. Scott on "A Locomotive Engine for the Accommodation of 180 Engines and Tenders." 8 p.m.
Northern Architectural Association.—Address by the President, Mr. J. Oswald. 7.30 p.m.

FRIDAY, NOVEMBER 15.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "House Drainage." 8 p.m.

Drew & Cadman	1,157	Gould & Brand (accepted) 1,091
Anley	1,145	

LONDON.—For rebuilding shop and premises, No. 16, Wigmore-street, for Messrs. Tansley & Co., Mr. A. J. B. Botton, architect. Mr. A. O. Bred, surveyor.—
 Linton £1,000
 Rywaters £1,000
 Parker £1,000
 Gould & Brand £1,000
 Godwin & Son £1,000

LONDON.—For repairs, sanitary and decorative works to No. 128, Gower-street, W.C., for the Trustees of the Christmas Estate, Mr. Walter J. Ebbetts, architect, Savoy House, 115, Strand, W.C.—
 J. J. Rayment & Sons £1,500

LONDON.—For alterations to No. 40, Burne-street, Edgware-road, and fitting same up as a restaurant for Messrs. Kington Bros., Mr. Robert Willey, architect, 33, New Bridge-street, E.C.—
 J. Carmichael £1,000
 Antill & Co. £1,000
 J. Bennett £1,000
 Holliday & Greenwood £1,444
 Lascelles & Co. £1,000

LONDON.—For alterations, &c., to "The Beehive," New North-road, Messrs. Thorpe & Furniss, architects, 154, High-street, Camden Town. No quantities.—
 Lambell £1,150
 Gould & Brand £1,543
 Toms £1,500

LONDON.—For alterations and repairs to "The Prince Albert," Elmwood-street, Essex-road, Messrs. Saville & Marun, architects, Dacre House, Arundel-street, Strand.—
 Perkins & Co. £1,400
 Toms £1,200
 Ward & Lambell £1,315
 S. Goodall £1,340
 Gould & Brand £1,400
 Morris & Goudwin £1,314

LONDON.—For pulling down and rebuilding "The Mechanics' Arms," High-street, Deptford, Mr. W. Willis, architect. Quantities by Messrs. E. Stanger & Co.—
 King & Son £1,140
 Gould & Brand £1,000
 Gladding £1,000

LONDON.—For providing additional offices for the girls' department of the Settlement School, Stepney, for erecting the drains to the existing offices, providing new water-closets for the teachers inside the building, and also a partly new system of drainage, for the School Board for London, Mr. T. J. Bailey, Architect.—
 W. Grear & Son £1,400
 W. Shurmer £1,000
 McCormick & Son £1,000
 A. Reed & Son £1,000
 Atherton & Dolman £1,000
 G. Munday & Sons, Tower £1,000
 H. H. H. £1,000
 G. Newton £1,000
 G. Munday & Sons, Tower £1,000
 H. H. H. £1,000
 G. Newton £1,000

LONDON.—For re-building Nos. 49, 41, and 45, City-road, E.C., Mr. E. W. Caldwell, architect. Quantities by Messrs. Wakelin & Bate.—
 Challen £1,000
 Dove Bros. £1,000
 J. Anley £1,000
 Simpson & Co. £1,000
 Grover & Co. £1,000
 F. E. Mitchell £1,000
 Scriveners & Co. £1,000
 F. E. Mitchell £1,000
 Scriveners & Co. £1,000

LONDON.—For the erection of a school on the site in Queen's-road, Dalston, N.E., to provide accommodation for 1,100 children, and for other work, for the School Board for London, Mr. T. J. Bailey, Architect.—
 G. Munday & Sons £1,400
 W. M. Dobson £1,000
 W. Pattinson £1,000
 S. Sons £1,000
 C. S. Williams £1,000
 Kilby & Gayford £1,000
 T. Boyce £1,000
 Atherton & Dolman £1,000
 Hart Bros. £1,000
 E. Lawrence & Sons £1,000
 C. Cox £1,000
 T. Grover & Son £1,000
 W. Shurmer, Upper £1,000
 Clapton £1,000

LONDON.—For erecting a school, with three central halls, for 1,200 children, cooking and laundry centre, and caretaker's house, at Dudding Hill, for the Willesden School Board, Mr. G. E. T. Laurence, architect, 181, Queen Victoria-street, E.C. Quantities by Messrs. Northcroft, Son & Nephew.—
 J. Chessum & Sons £1,000
 R. A. Verbury & Sons £1,000
 A. Kellert £1,000
 J. Parnell & Son £1,000
 G. Godson & Sons £1,000
 G. Neal £1,000
 A. Kellert £1,000
 J. Parnell & Son £1,000
 G. Godson & Sons £1,000
 G. Neal £1,000

LONDON.—For the erection of three temporary school buildings on a site in Lee-street, Maresfield, Plumstead, for the School Board for London, Mr. T. J. Bailey, Architect.—
 Hill & Smith £1,000
 C. & G. Keay £1,000
 T. Crows £1,000
 J. Dixon & Co. £1,000
 Croogson & Co. Ltd. £1,000
 D. Charters £1,000
 L. Lynght, Ltd. £1,000
 Humphreys £1,000
 Knightsbridge £1,000

LONDON.—For erecting a school with three central halls, for 1,200 children, cooking and laundry centre, and caretaker's house, at Leopold-road, for the Willesden School Board, Mr. G. E. T. Laurence, architect, 181, Queen Victoria-street, E.C. Quantities by Mr. Morgan H. Young.—
 J. Chessum & Sons £1,000
 R. A. Verbury & Sons £1,000
 A. Kellert £1,000
 J. Parnell & Son £1,000
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 G. Godson & Sons £1,000
 G. Neal £1,000
 A. Kellert £1,000
 J. Parnell & Son £1,000
 G. Godson & Sons £1,000
 G. Neal £1,000

LONDON.—For providing and fixing a complete system of low-pressure hot-water apparatus at the old school, in Camden-street, Camden Town, for the School Board for London, Mr. T. J. Bailey, Architect.—
 Maguire & Son £1,000
 C. Davis £1,000
 W. W. Smith, Gray, & Co. £1,000
 J. F. Clarke & Sons £1,000
 F. C. Hoskins, Westminster £1,000

LONDON.—Accepted for building new water-closet, buildings and conveniences, and remodeling the whole of drainage and sanitary work at St. John's School, Westminster, for the School Managers.—
 F. C. Hoskins, Westminster £1,000

LONDON.—For rebuilding the offices of the girls' and infants' departments of the old portion of the "Victoria" School, Becklow-road, Starch Green, and for providing a new system of drainage, for the School Board for London, Mr. F. J. Bayard, Architect.—
 R. A. Verbury & Sons £1,000
 G. S. Williams & Son £1,000
 B. E. Nightingale £1,000
 R. A. Verbury & Sons £1,000
 G. S. Williams & Son £1,000
 B. E. Nightingale £1,000

LONDON.—For building three shops and nine cottages, Vere-street, Colindale Estate, Fulham, S.W., Mr. Jos. G. Denton, architect.—
 J. P. Groom £1,000
 Conway £1,000
 Saywell J. Hall (accepted) £1,000

LUTON.—For supplying, fitting, and completing an iron girder bridge, at the Manor-road, Luton.—
 W. Beethell £1,000
 Cross & Cross £1,000
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Apprenticeship.

THE Technical Education Board held last year a systematic inquiry into the actual state of apprenticeship in the various trades in London, and collected from various

employers of labour their views in regard to the possibility of developing the system in the future. The general results were published a few weeks ago in the *London Technical Education Gazette*, and form an interesting practical summary of the situation.

The proportion of recruits entering the building trades as apprentices is very small at present, only 80 among a total of about 1,000 persons; and four firms, each employing about 1,000 hands, had not an apprentice among them. The reasons given for this are not very different from the reasons which have recently been given for the bad condition of the building art generally. We are told of the engrossing nature of London businesses on their commercial side, the extensive use of machinery, the absolute necessity of utilising all available space for securing the maximum productive power; and hence, as a natural sequence, the reluctance of employers to undertake moral responsibilities which they know that they cannot satisfactorily discharge. All this is the same thing over again as Mr. Lethaby's complaint of last week. It is another of the results of the competition system. Everything is cut so close by that system that the contractor can have no time or thought for anything except how to get the work done fastest and cheapest so as to secure a margin of profit; and not only is there no opportunity left of producing good work, but there seems also to be no time or inclination even to teach any one his trade. Everything is at high-pressure speed, and the manager of the shop has not time to think of apprentices and will not be troubled with them. For one of the additional reasons given is that the question of discipline becomes a difficulty. If a boy apprenticed for a term of years is guilty of misconduct, and seems a confirmed bad character, the employer has only a legal

remedy which is troublesome and expensive, and the application of which is consequently avoided; and the same applies if an apprentice, eager for better wages, throws over his articles and engages himself elsewhere. The master has not time to trouble himself about the necessary legal machinery, and consequently prefers to avoid a system in which he will not be exposed to these complications.

The "learner" is however taken by many who will not take the apprentice. The "learner" is a kind of free apprentice; he is there for the same purpose as the apprentice, but he is not bound, and therefore can be dismissed at a moment's notice for misconduct, a condition which naturally renders him a good deal more amenable to discipline. The "learner" sometimes seems to get as much assistance and training as he probably would if he were a regular apprentice; in other cases (and we should suspect that these were the majority), he merely "picks up" what he can. This, it will be admitted, is a state of things which offers a very poor prospect for the improvement of work in building. The information furnished in regard to the bricklaying trade especially* is very unsatisfactory reading, and serves no doubt to account for the character of a good deal of the brickwork that is to be seen in these days. Learners, we are told, are admitted without agreement of any kind, "many being raw boys or boy labourers brought in through speculating builders, while others are often sons of journeymen." The common bricklaying is picked up by these learners, who are frequently put to work on the inside wall; a truly characteristic method of managing. There is a strong opposition in the trade to adult labourers advancing to the rank of journeymen, but they manage to escape to some extent the vigilance of the journeymen; and the labourer, "having picked up some knowledge of bricklaying with one firm, frequently obtains employment in another where, calling himself a bricklayer, an opportunity is afforded of doing ordinary brickwork." The grammar of this sentence is rather novel,

* The information about the various trades, included in the Report, appears to have been furnished by a number of large employers of labour, whose names, however, for reasons which one can easily understand, it has probably been thought better not to give.

but the complaint is a very old one; we heard of it in nearly the same terms a quarter of a century ago.

In spite of the objection of employers to taking apprentices under the existing state of things, it appears however that some of them have a very decided opinion in favour of the system, and would be very glad to adopt it more largely, and assist in its re-development, if the circumstances under which it would have to be carried out were modified. The paragraph in the Report in which this point is stated is very important, and should be as widely read as possible, and therefore we quote as it stands, calling particular attention to the sentence which we have printed in italics:—

"It was admitted on all hands that something should be done to improve the condition of the London workmen as regards general knowledge and skill. All the firms waited upon showed a keen desire to promote the success of the Board's work, and many of them testified to the value of the technical instruction now being provided in the various schools and classes; *but there exists a deep-rooted belief in apprenticeship as being the best means by which a boy can learn his trade and eventually secure good wages, for it was often acknowledged that only those men who have served as apprentices are able to practise the trade in its higher branches.* If, however, any attempt is made to revive apprenticeship—and employers do not appear to be unwilling to co-operate to this end—all the circumstances of the case must be taken into account; there must be a wider recognition of the modern conditions of industry, a better understanding concerning agreements, especially, as regards the discipline of lads, and—as bearing very directly upon this latter point—a revision of the scale of payment to apprentices. The reluctance on the part of employers to undertake the responsibilities connected with apprentices, already referred to, might perhaps be overcome if the present limitations of the workshop-training were more fully recognised under the indenture, while the discontent and consequent bad discipline among apprentices would, it is thought, be largely removed if the wages paid during apprenticeship were calculated upon a higher basis, say, commencing at 20s. per week."

In regard to the difficulty of control of the apprentices, it is observed on another page of the Report that the least annoyance in this respect is experienced with those boys who are bound through various organisations, such as City Companies, Charity Trustees, Boards of Guardians &c. Of course the real explanation of this is that these are picked boys, selected by organisations which have made it a business to inquire into their character; and the only reason, as far as we

can see, why the apprentices directly engaged by the employer should not turn out equally satisfactory is really the same difficulty already referred to, cropping up again viz.: that the employer is so completely occupied with the cares of a business carried on at almost ruinous competition, that he has no time to make inquiries, and takes the apprentice on chance. The Report suggests that it would be well if all apprentices were subject to the control of a board acting as an intermediary between employers and parents. This would certainly be likely to ensure a better stamp of character and education in the average apprentice than appears, from all accounts, to prevail at present.

Under the heading Carpenters and Joiners the Report affords some interesting remarks. The words "carpenter and joiner," it is observed, have lost their old meaning; "a carpenter used to be considered competent to produce a finished article from the raw material, and under the old apprenticeship system he was taught to do this; but now he is regarded as only capable of doing the rougher kinds of work, such as flooring joisting roofing. . . . The joiner, on the other hand, is a more skilled workman, as his outfit of tools indicates; the extensive use of machine-made joinery, however, threatens to transform the joiner into a wood-fitter." On this latter point, however, there is nothing to be said. Against the pretence of machine-made ornament we have always set our face, but it is perfectly absurd for any enthusiasts to suppose that wood-working machinery for the constructive portion of woodwork will ever be put aside now, to satisfy any theories as to what is good for the workman. It is however, quite right that apprentices should be taught to carry out their work by hand, as in this manner only can they really learn the subject; and the Report states that great care seems to be exercised in this matter among employers, and that, in spite of the difficulty arising from the prevalence of machinery, both "learners" and apprentices are afforded many facilities for learning handwork, one firm making it a rule to teach its apprentices to set out and prepare work entirely by hand. It appears that there is a larger amount of apprentices and learners in this trade than in most others, which is attributed to a desire to avoid the dirty work of some of the other trades; and indeed, what branch of building work can be more attractive and wholesome than joiners' work? It is also interesting to note that among the existing number of foremen and clerks of works four-fifths (so it is stated) have been joiners. As there is no particular reason why joiners rather than men of any other trade should be fitted to become clerks of works, the fact seems to imply that a considerable proportion of the cleverest apprentices or learners seek to enter this trade.

In the Masons' trade it is stated that apprentices and learners are taught under the direction of the foremen, and they are put to work with men specially selected for the purpose of assisting them to progress. Perhaps this is to some degree a mutual benefit; it is noted in the general remarks in the Report that some firms consider that a few industrious learners have a very good effect in the shop, the questions as to "how" and "why" having the effect of stimulating the attention of the older hands to the principles of their work, and keeping them from running too much into a mechanical groove. Among the masons we are told again that there is great objection to labourers advancing to the rank of journeymen, and that they are as a rule restricted to the heavy and dirty work of a mason's yard, including the purely mechanical operation of rubbing stone. This, which is charged to the influence of the trades unions, is truly a beautiful and Christian principle—"keep another man from advancing in his work, lest he should interfere with me." The following sentence we do not quite understand:—"Labourers are not allowed to re-clean masonry, a rough class of work which,

it is alleged by employers, is not proper masonry, and which journeymen masons are not prone to undertake." Then by whom is it done?

In the Plastering trade legal indentures are the exception, but learners are admitted and work under the direction of foremen in many cases, though in other cases they only "pick up" what they can. The proportion of learners throughout all the trades who merely "pick up" their trade as they can seems to be, though not as large as it might be, a great deal too large. In regard to both plasterers and plumbers, both of whom work habitually in pairs, a superior man and an assistant or "mate" (as he is called in the plumbing trade), we find the same remark, that the superior worker is apt to be jealous of the advance of the other, and will not let him learn too much, and that in the plumbing trade the rather stupid style of "mate," who can only do routine work under order and will never advance beyond it, is preferred to the cleverer man: all which is rather melancholy reading.

In regard to the certificate of the Plumbers' Company the Board had collected some opinions. The firms which make plumbing a specialty are strongly in favour of the examination and registration, while others assert that the examination is often passed by a cramming system, that there are thoroughly competent workmen who could not pass the test (which is very likely), and that it affords no guarantee of good workmanship. Nevertheless, we may safely affirm that, while theory will not make a bad workman a good one, there is no good workman who will not be the better for a thorough understanding of the theory and principles of his work.

A few among the firms who were applied to gave their opinion in regard to instruction in technical schools and classes. The general feeling seems to have been that it is not of much value in a practical sense, and is too much of a mere exercise or recreation; moreover that the instructors are rarely sound practical men, "such as are secured as builders' foremen." We have heard from other quarters of the difficulty of getting precisely the right people for instructors in technical classes; and it may be questioned, supposing the class of men "such as builders' foremen" were secured, whether all or many of them would have the capacity for teaching. That is the *crux* in regard to technical classes; the practical man often cannot teach, and the man who can teach is not practical. One significant remark is made: "It is not wise to ask intending teachers whether or not they are member of trades unions, as any preference for such members tends to exclude those who have excelled in the trade." The italics are ours. Could anything be more wretched than the conclusion implied? Throughout the whole inquiry there is constantly evidence of this hateful and contemptible spirit, which would keep down the cleverer man to the level of his fellows, lest his better work should compete too successfully with theirs. The Trades' Union is an organism for keeping work to an average level of ability and industry, beyond which the exceptionally able and energetic man is not to attempt to rise; the individual workman is jealous of his mate or his apprentice, and prefers a stupid one who will not be likely to learn to outshine him. There will never be, so to speak, any blessing on labour carried out in that spirit.

On the whole, the results of the enquiry undertaken by the Technical Education Board seem to show that all which has been lately said as to the advantages of the apprenticeship system for learning a trade is perfectly true, and is admitted to be so even by those who under the present circumstances cannot see their way to employ the system in consequence of their absorption in the financial success of their business, arising from the stress of competition. This latter will not be got rid of in a day, and it

seems that some assistance will be given towards the adoption of the apprenticeship system by employers, if the practice is formed of taking apprentices through the recommendation of bodies which can make inquiries as to character, such as the employer cannot undertake. A great deal of the method which is employed with "learners" is equally applicable to apprentices, and the difference seems to be often only nominal, except that the learner can break off his course of learning and rush after a job with his education incomplete, while the apprentice is fortunately debarred from doing so. What is done for learners in some of the trades, apparently to a considerable extent, can just as well be done for apprentices. There can be no instruction much better than setting a learner or apprentice to work with and assist a competent workman, and learn his work as he goes on, by sight and handling at the same time. The practical drawback seems to lie in the fact that the elder workman is often jealous of any sign of his junior becoming too clever; and the only cure for this is a higher moral principle among workmen, when they may learn to be ashamed of the low standard inculcated by trades unionism, that he serves the cause best who takes care not to do his work too well, and prevents others doing so. It can hardly be expected that there will be any widespread and permanent improvement in building work until the principle is again generally recognised among artisans, as once it was recognised, that the true honour in connexion with handiwork, as with all other work, consists in doing it as well as possible, not in being paid as much as possible for it.

ASIA MINOR.

THE new edition of Murray's "Handbook for Asia Minor," which, according to a statement in the preface, been entirely rewritten, with the exception of some notes on the islands. As such books must be more or less compilations, the author in this case is described as the "Editor." There are no doubt many who could have produced such a book; but Sir Charles Wilson has many special qualifications. He was one of the first explorers in Jerusalem for the Palestine Exploration Fund—that was before Sir Charles Warren's explorations—and he has made a special study of the archaeology of Jerusalem and the Holy Land, including Syria. He is one of the Executive Committee of the Palestine Exploration Fund; he has also been the "Director" to the Palestine Pilgrim's Text Society, whose publications have thrown so much light on the archaeology of Palestine. This implies an extensive knowledge of at least one of the regions which borders on Asia Minor. As to Asia Minor itself, he has had special advantages for acquiring information; for this he is indebted to his having held the appointment of Consul-General in it for four years—from 1879 till 1882—during which time his official duties required him to travel over the most of the region. In the preface he acknowledges the assistance he received from many gentlemen who are familiar with Asia Minor; of these it is only necessary to mention here the names of Professor W. M. Ramsay, Mr. D. G. Hogarth, M.A., Mr. Phéné Spiers, and Mr. G. Weber of Smyrna, as these gentlemen have supplied information on archaeology and architecture. Professor Ramsay, who is so well known for his archaeological explorations in Asia Minor, has been Sir Charles's companion while visiting some of the archaeological remains, and he contributes the description of the Phrygian monuments, "several of which he was the first to discover." Mr. Hogarth supplies the account of the Hittite sculptures at Euyuk and Yasilı Kaya.

* "Handbook for Travellers in Asia Minor, Transcaucasia, Persia, &c. Edited by Major-General Sir Charles Wilson, R.E., K.C.B. London: John Murray, 1895.

The "Handbook" includes Armenia, Transcaucasia, and part of Persia and Mesopotamia; but these may be looked upon only as fringes of Asia Minor, whose boundary on the eastern side has always been slightly definite, and appears to be far from settled in the present day. Should anyone wish to study the architecture of Armenia and Georgia, he will find accounts of Ani, Gori, and other places, where churches and rock-cut tombs and caverns exist. At Ani many thousands of these caves may be seen; and at Gori they are called "rock-cut dwellings," and said to be pre-Christian. The architecture of this particular region has not yet received much attention in this country; the churches are classed as Byzantine, but they have features supposed to be derived from Sassanian or Persian, while at the same time they form links with the architecture of Russia.

The "Handbook" begins with a very able and concise historical sketch, the combined work of Mr. Hogarth, Professor Ramsay, and the Editor. It commences by stating that "Asia Minor has been a thoroughfare to many conquerors, the abiding place of one, a debatable land on which the armies of East and West have fought, or marched towards continents beyond. Independent powers, Hittite, Phrygian, Lydian, arose within its borders and disappeared again not before the dawn of history; the Greeks fringed it with colonies, and slowly extended their influence on the central plateau, but lost more and more of their national character as they advanced. The Persians held it weakly, the Romans strongly, but always as a province; the Seljuk Kingdom of Rûm or Konia was finally subject to the Grand Seljuk, and the Osmanli conquerors halted in the peninsula only for a few generations." This description is necessary, and should be kept in mind in attempting to form a correct idea of the remains of art in Asia Minor. Most of these transitory hosts built and sculptured in their own style while they ruled, and remains more or less extensive of them are still to be found. Some brought a style with them, others employed the style they found in the locality; under such circumstances there was little or no originality, and no style was carried on and improved on so as to stand out from the others, and become celebrated. If we take Greek architecture as an illustration, there were no magnificent structures erected in this style, such as the temple of Artemis at Ephesus and the Mausoleum at Halicarnassus, but from what we now know of them, neither reached the high perfection of the same art in Greece. The sculptures from the Mausoleum may be seen at Berlin, and casts of a couple of them are in the South Kensington Museum, and they also fall far short of the higher standard. Still, the art and architecture of Asia Minor is of great value in many ways; its study will assist in tracing out the history of some styles and of early forms of art, more particularly such as the Phrygian and Hittite, for it is in that direction we expect to find additions to our knowledge regarding them.

This is a guide to the whole of Asia Minor, and, of course, deals with the remains of architecture left by the Greek colonist along the coast of the Mediterranean; these have been studied, and being well-known to architectural scholars, need not be mentioned upon here. There are other styles which are known to exist, and as yet our knowledge of them is but fragmentary, consequently there is an interest attached to the details of these that may be found. The handbook speaks highly of the architecture of the Seljuks, as one of these styles which our knowledge is limited. In the course of the introduction which is by Sir R. Meldrum, he writes thus,—"The Seljuks of Rûm, like the 'Great Seljuks' of the main line, were liberal patrons of art, literature, and science, and the remains of buildings they erected are amongst the most beautiful and interesting in Asia

Minor. At no period was Moslem art more brilliant. The *Medresses*,* with their quiet 'quads,' overlooked by the windows of the students' apartments, their small mosques, and their fine gateways, are not unlike, in plan, the Colleges at our Universities; the fortifications, the bridges, and the great khâns are built with a care and solidity that are almost Roman; and the mosques and tombs, though Persian in character, have a beauty of their own. Strong Persian influence is apparent in the freedom with which representations of animals and the human form are used in decorative details; and in the employment of glazed bricks of various colours in the palaces and in the minarets of the mosques. The beautiful buildings at Konia, Nigdeh, Kaisariyeh, Sivas, Amasia, Divrik, and other places well deserve the careful study of a trained architect, and the commemorative inscriptions which many of them bear would, if copied, probably throw light on the obscure history of the period." The Seljuk period began about the eleventh century.

It is not exactly the purpose of a guide-book to treat scientific subjects in the manner one might expect in a special essay, and in this matter of the architecture of the Seljuks, it appears that its principal remains still require "the careful study of a trained architect," before we can know it properly. All that we do know is that it reached a high degree of excellence, that a large portion of it was constructed with crude brick, which was covered with glazed bricks and tiles, and that the style was of Persian origin. It was this Persian style which extended through Khorassan and Afghanistan, which the Mohammedan conquerors of India carried with them, and which was developed into the beautiful architecture that now makes Delhi and Agra so celebrated. This is a very wide space for one style to have covered; but we now know, in addition to this, that the Persian style grew out of the Sassanian, and the Sassanian at one time existed—probably with variations—all the way from Moab to Bokhara and Samarkand in Central Asia. The whole history of this style, from its first beginnings down to its latest developments in Asia Minor and India, will, when it is written, form a brilliant chapter in the history of architecture; but before this can be done trained architects will yet have to explore and collect material from more than one region in the old world.

There is another subject which to the art-student adds an interest to the archaeology of Asia Minor; this is the existence of Hittite remains, which are found in a number of places, such as Boghaz Keui, Yasili Kaya, Euyuk, Ivris, and the pseudo-Sesostris figures at Karabel; and, from the Hittite characters discovered by Professor Sayce, the Niobe at the base of Mount Sipylus should perhaps be included among them. Some illustrations of these sculptures appear in the "Handbook," and references are made to Perrot and Chipiez's account, where they will be found well illustrated. The Phrygian sculptures are also illustrated in the "Handbook," but these, judging from the representations of lions on the Lion Tomb, are probably the same as the Hittite; the other tomb with the warriors, of which there is an illustration, may be much later. The "Handbook" agrees with M. Perrot in looking upon Hittite art as being only a rude offshoot of the art of Assyria. This is probable, but unless we have historical data to guide us, it is generally a most difficult question to decide whether monuments executed in a weak and seemingly primitive manner, belong to the first rude beginnings or to the rude endings of the particular style it is classed with. When the philologists have managed to read the Hittite hieroglyphics, we may then be in a better position to form a judgment on this point.

The lion tomb of the Phrygian monuments bears, in its design, a strong resemblance to the lions over the gate at

Mycenæ, but the Phrygian animals are far inferior as works of art. This tomb was discovered by Professor Ramsay in 1881, but ten years before that Professor Ernest Curtius had prophesied that some future traveller would find in Phrygia the prototype of the Mycenaean gateway. This belief of the eminent scholar was no doubt derived from the legend that Pelops was a Phrygian, and the realisation of his words tends to show that at times some value may be derived from what has come down to us as mythical history.

The early religion of Asia Minor was the worship of a goddess, the personification of Mother Earth, from which the Artemis of Ephesus was derived. This goddess was known as Cybele, and the Niobe of Mount Sipylus is now accepted as a representation of her. Sir Charles Wilson, Professor Ramsay, and others are agreed upon this. It may be worth mentioning that the writer of this notice made what was perhaps the first sketch of the sculpture about twenty years ago, and the conclusion he formed was that it represents a male figure. This conclusion was derived from the total absence of breasts; and the head, which now is so worn that it is without features, appeared as if this part of the figure could not be restored without adding a beard. In the "Handbook" it is classed among the Phrygian sculptures.

In the present day, when architectural styles are being traced back to their earliest beginnings, it would be important to have some traces of the architecture of the Hittites. As yet, at least, with a very slight exception, the remains of this ancient people that have been discovered are all sculptures with representations of figures; and we are now tolerably familiar with their manner in this branch of art; but unfortunately, none of these sculptures contain any representations of buildings, and we are left almost entirely in the dark as to their structural productions. The slight exception referred to is found in the remains of what is assumed to have been a palace at Boghaz Keui, the ancient Pteria. A plan of the ruins is given, and the palace is indicated, but on a very small scale; Perrot gives a larger plan, and a drawing of them from Texier, from which the character of the remains can be made out. Now this plan, it is acknowledged, bears a family likeness to the plans of the palaces of Chaldea and Assyria; there is the same large space in the middle, surrounded by a number of smaller rooms, which we know were in the Assyrian examples covered with barrel-roofs, formed of crude brick. We also know that the walls of the Assyrian palaces were built of this material, and we may suppose that the Hittite walls were the same. The evidence for this is fairly satisfactory; one of the marked features of crude-brick construction was that of a stone foundation to prevent the sun-dried material from coming in contact with any chance accumulation of water that might soften it, and bring down the walls above. Texier's drawing shows this foundation wall of stones as still existing. There are said to be about two courses still visible, and on the top they remain tolerably level all over. Had the walls been wholly of stone, the ruin would not have remained so level all over as we now see it; and the stones that have fallen would have remained in heaps. At Euyuk—of which there is a plan in the "Handbook," but a drawing of the same, given by Perrot, conveys a more perfect idea—there exists the remains of another building, with the same foundation courses, and also level on the top where the crude brick began. These foundations leave scarcely a doubt as to the character of the material of which the walls upon them were constructed.

Beyond this little can be said about Hittite architecture; but as we live in an age of explorations, perhaps the future may produce further information. We have one reference to it which may be worth quoting here, as the words imply that it probably possessed some kind of merit. In the cuneiform inscriptions of Sennacherib,

* *Medresse*, "College."

published in the "Records of the Past," vol. vi., New Series, edited by Professor Sayce, after describing the taking down of an old palace, there occurs the following passage:—"In a favourable month on an auspicious day I built on this foundation according to the wisdom of my heart a palace of *pilu* stone and cedar wood, in the style [?] of the Hittites, and a great palace in the Assyrian style [?] which far exceeded the former in adaptation, size, and artistic excellence, through the work of the wise builders of my royal rule." Whatever may have been the character of the Hittite architecture, the words of the inscription appear to imply that it had some features that were different from the style practised in Assyria.

NOTES.

THE Durham County Council sat on the 7th in consideration of the question of the County Buildings competition. Of course no one who knows much of the ways and workings of corporate bodies in these matters would seriously have expected that they would have re-considered their decision. The Council dwell much upon the fact that they were acting within their legal powers; having arranged those legal powers, in the terms of the competition, so that they could leave themselves full liberty to throw over everybody and everything. It appears, however, as if the assessor, Mr. Vickers-Edwards, had not made things as clear as he might have done. The following letter from him to Messrs. Tree and Price was read:—

"County Surveyor's Offices, Wakefield,
November 1, 1895.

DEAR SIRS,—I have received the copy of the protest re the Durham New County Offices, and carefully perused the same. That the design marked 'Onward' was far and away the best scheme I think it will be difficult to contend against, and it was purely on merit. The design marked 'Demos,' which I understand the Council wish to carry out, should, I think, have been disqualified, not having complied with the instructions and regulations issued to competing architects. Of course the Council is not bound by my award, but it is the usual practice to abide by an assessor's advice or prove the same incompetent and bad. Such course has not been adopted; and I consider that Messrs. Cooksey and Cox have not received that fair play and justice which Englishmen are entitled to.—Yours faithfully,

J. VICKERS EDWARDS.

Messrs. Tree and Price.

The Durham Council assert that the assessor did not point out to them the reasons why the plans selected should have been disqualified, and on this point we have as yet no explanation. The protests of the Institute of Architects and of the Northern Architectural Association were characterised as "inimical to the interests both of the ratepayers and the profession," and the chivalrous protest of the other competitors was characterised by Lord Ravensworth, a member of the Council, as "a professional squabble." The conclusion we have long ago come to is that the competition has been a mere pretence from the first, and that the result of it was prearranged, and it appears to us to be one of the most discreditable things that has ever taken place in connexion with an architectural competition organised by a public body. In fact, although we have always maintained that the assessor in a competition should be rather an adviser than a judge, the result of this one almost inclines us to think that, unless in a limited competition and where the competitors have very good reason to believe in the good faith of the committee, it is not safe for architects to expend their labour on competitions except on the condition that the assessor's award should be binding.

THE London County Council having passed a motion practically dictating to the Government the terms in which a Bill for the establishment of a Water Authority is to be introduced, have now followed up this move by a resolution to the effect that

the City and County of London are to be united. These motions are mere waste-paper; there is no public feeling in favour of such a proposal; on the contrary, the last election showed that popular opinion was against such proposed change. The question at present is too academic for serious discussion. London desires to see the water question settled and various improvements carried out before it begins to think of amalgamating the Corporation of London with the County Council.

THE School Board for London have issued their annual schedule of the sites which they propose to acquire for either new schools or the enlargement of their existing premises in order to meet the constantly-increasing demand in that behalf. The aggregate number of sites thus fixed upon is seventy-three. These are distributed in the official Divisions of Chelsea (2)—at Hammersmith and Kensington, Finsbury (8)—at Islington and Stoke Newington, Greenwich (11), Hackney (8)—at Hackney, Shoreditch, and Bethnal Green, East Lambeth (13), West Lambeth (12), Marylebone (1), Southwark (7), and the Tower Hamlets (11). We notice that the requirements for additional school accommodation are largest in the east and south of London: at Mile End Old Town, Poplar, St. George's-in-the-East, Limehouse, Stratford, and Bromley; and, south of the Thames, at Greenwich, Charlton, Lewisham, Plumstead, Penge, Camberwell, Deptford, Newington, the Borough, Lambeth, Clapham, Battersea, Streatham, Wandsworth, Rotherhithe, and Bermondsey. As regards the several divisional areas, the highest total is that scheduled for West Lambeth, being about 550,115 square feet; next in point of extent rank Greenwich and East Lambeth, about 471,075 square feet and 201,172 square feet respectively; then comes the Tower Hamlets Division with about 197,617 square feet. In our figures we have made allowance—by striking the mean—for each case (there are five in all) of "alternative sites," so that, following such computation, we find that the total of areas to be taken amounts to about 1,879,956 square feet, or a little over 43 acres, for sixty-seven sites. One of the sites is unusually large, namely, that in Lavender Sweep, near Clapham Common and the Junction; it comprises a plot of land in Limburg-road, together with Lavender Lodge, its gardens, and stabling; about 135,870 feet superficial.

THE report of the Examinations Department of the City and Guilds of London Institute for the Session 1894-5 states that there is a marked increase in the number of candidates in plasterers' work, the numbers at three successive examinations having stood at six, twenty-three, and thirty; and the Examiner is now hopeful of some real improvement being effected in this trade, by the aid of the instruction given in the technical classes, and the stimulus to better work afforded by the prizes offered by the Plasterers' Company. In plumbers' work the number of candidates has for some time been very large, and is still increasing; 1,333 came up this year, as against 1,253 the previous year. In mechanical engineering there has been a falling off in the number of late years, which still continues, but this is considered to be due to the greater difficulty of the examination, and it is apparent that a higher class of artisans are presenting themselves for it than formerly. The attempt to supplement the work of examination by inspection has proved satisfactory, but there is great difficulty in finding competent inspectors on trade subjects. The new programme recently issued contains a syllabus of instruction in painters' and decorators' work, in which subject an examination will be held in 1896.

IN the eighteenth "Hallisches Winckelmanns Programm," Dr. Carl Robert discusses the question of the frescoes of

Polygnotus at Athens and specially those in the Stoa Poikile. His work in connexion with the frescoes in the Lesche at Delphi is well known, and it may suffice to say here that the same method is pursued in the present treatise, and that the restoration attempted shows the same wide command of the artistic material available, and especially of Greek vase-paintings. As regards the technique of Polygnotus, Dr. Robert sums up his results as follows:—The pictures used for the decoration of walls by Polygnotus are of about 5 metres in height, and of very varying width, the figures are approximately life-size. They are sometimes painted on stucco, sometimes of separate wooden panels fastened to the wall. The ground is white, the figures are painted in flat tints without shading; the ground is not treated as a background, the only indication of any such idea are curved lines, which denote that the whole scene was a hill country. The figures are disposed evenly over this ground, and some of them are intercepted midway by the curved lines. As to colours, black, white, red, and yellow of various shades are the main colours; green and a particular sort of blue are occasionally intermingled. Dr. Robert confesses in his concluding words his conviction that the smallest fragment of the actual paintings may at any time do more for the understanding of the art of Polygnotus than volumes of speculations, and he shares with all archaeologists the hope that at any moment the French excavations at Delphi may be crowned by the discovery of some portion of the decorations of the Lesche. On the Acropolis have been found fragments of frescoes of the same date in excellent preservation, so the hope is not unreasonable.

THE correspondence in the *Standard* upon the taking of chills in churches reveals some amusing differences of opinion as to the causes of such illnesses. But experience has shown that however good may be the warming and ventilation of these edifices quite a small amount of carelessness on the part of those in charge of them will have uncomfortable consequences for a congregation. If, for example, the place is overheated when the weather is very cold, a frequent mistake, the extreme change of temperature will often produce very injurious effects on some members of a congregation. An architect can no more prevent such mishaps than can the builder of a steamship prevent those in charge of her from going too fast in a fog. There is no doubt also that inefficient heating and ventilation frequently arise from an undue parsimony when a church is built or repaired, and architects ought strenuously to insist on the best means being used. The physical tendency to take cold is probably, on the whole, greater in churches than in any other places; the robust frequenters come in warm after exercise and liable to take cold. Many delicate persons, on the other hand, sit for considerable periods in churches where they are quite unfit to remain stationary except in their own houses. Architects have, in fact, to protect congregations from their own rashness.

ANOTHER of the constant complaints about bad water-supply in country districts comes up in Dr. W. W. E. Fletcher's report to the Local Government Board on the sanitary circumstances of the Thurston Urban District. It appears that so far back as 1878 the water-supply of a portion of Thurston was pronounced by Mr. Dalley, then Medical Officer of Health, to be bad; but hitherto it has been found impossible to move the late Local Board, or the present Urban District Council, to provide a proper water-supply for the place, although such a supply could be obtained, without difficulty, from the water-mains of the Corporation of Leicester. The actual supply is derived from numerous surface-wells usually sunk in backyards or gardens, said to be dry-stained with bricks. From such indefinite answers as

ould be obtained it would appear that few of them exceed 20 ft. in depth. The water is clear, and is usually well spoken of by the inhabitants, but what its hidden qualities are likely to be may be judged from the wells. It is beneath a fowl-run, ten yards from a privy, less than six yards from a catch-pit for drainage of a piggery; another 12 ft. in a churchyard (closed on account of being overfull), and on a lower level; another in yards from a shallow hole for ashes and refuse, about the same distance from a disused piggery, and about eight yards from a privy cesspit. We get the same kind of story from High Wycombe, where Dr. Wheaton reports that the water is partly from shallow wells which are most commonly situated in back kitchen houses, or in yards, and nearly always in proximity to sources of possible contamination of the water afforded by them. The soil is gravelly soil in which they are sunk, the fact that they are only dry-steined, without external puddling of clay or cementing of the brickwork lining them, but the percolation into them of matters in the surrounding soil. They are not lined out, except when illness arises or the water becomes evidently foul. The most common source of possible contamination of the water in these wells arises in their proximity to closets, the well being frequently situated close to the closet, the soil-pipe or the house-drain passing the side of the well, or even over the top of it.

It seems likely that the Hull Corporation will follow the example set by Bradford, St. Pancras, and will double the pressure of their electric supply. They are waiting to consult with the Board of Health, who may insist on certain alterations made in existing fuse-boxes and switches. There are now plenty of 220-volt lamps in the market, and their efficiency is quite as high as that of the ordinary 100-volt lamp. One serious question to be considered by companies wishing to supply at a higher pressure is the cost of supplying all their clients with lamps. It is obvious that it would not be to put their clients to the expense of installing new lamps, their old ones being used at the higher pressure, simply to suit the convenience of the company. Hence the equitable arrangement seems to be that the company supply the new lamps. To a large company this would involve very considerable expense. Mr. A. H. Gibbings, Consulting Engineer to the Hull Corporation, has calculated that, allowing for the sale of the lamps, the net cost of the change over would be about 1,500*l*. As there are some 200 lamps concerned, this estimate seems to be too moderate.

WE all know pretty well by this time what to expect when we go to an exhibition of Mr. Herbert Marshall's drawings, a collection of which is now on view at the Art Society's Gallery—"London; its streets and river." Mr. Marshall is in fact an artist of London, and his water-colours have done more than anything else to show people how much real picturesqueness there is in our capital, in spite of its bad reputation for outward attractiveness. Mr. Marshall is dependent, no doubt, as London effects are, a good deal on the effect of the atmosphere, and he makes the most of mists and sunset colouring; but still his scenes are generally faithful to the originals, and their locality easily recognizable. From the purely artistic point of view some of the smaller drawings of the present collection are the best; "Whitehall, looking south" (4), with the Houses of Parliament towers in misty outline above the houses; "Millbank Wharf" (10); "Cannon-street" (12), a fine thing in colour, the silhouette of St. Paul's is not entirely in proportion; "The Abbey and

Millbank" (22); "The Pool Frost-bound" (24); "Ludgate Hill from the Cathedral Steps" (27), a capital little composition; "Kensington Gardens" (29), with the Palace in the background; "Chelsea Twilight" (33), the twilight effect very beautifully and truthfully given. "The Pavilion at Lord's" (61), is a peculiarly bright sketch, and "Southwark Foreshore" (63) a powerful little study of colour in things dilapidated. In his large drawing of "Trafalgar Square" (23), Mr. Marshall has departed from his usual topographical accuracy by bringing St. Martin's part way down the hill to make it a dominant central object in the composition, instead of showing it as it is, nearly in line with the National Gallery; this is not quite a fair way of making a picture; the smaller version of the scene (69) is more correct.

THE special principles of the New English Art Club seem to become more and more difficult to define. Some of the best works in the Dudley Gallery have no common ground with those which are supposed to represent the special "new-ness" and "Art-Clubness" of the exhibition. Mr. Moffat Lindner's "Toledo" and "Pasajes" (12 and 26) are simply admirable specimens of rapid colour-sketching, such as any able artist might execute as a record of effect when there was no time to put in details. Miss Malcolm's "Portrait of Miss Elsie Young" (10), one of the largest works, is pretty and graceful, but rather suggests the art of the last generation than of the coming one. Mr. Mark Fisher's admirable little "Moonlight" (49) is masterly, but Mr. Fisher had made his own reputation long before the English Art Club was started. Mr. Furze in his portrait of the Hon. and Rev. Lyttelton (63), and Mr. G. Thompson in that of Mr. R. O. Sickert (51), in which the hands are particularly well painted, may be said to have toned themselves down (or up) to the level of ordinary artistic style; while Mr. Wilson Steer in his portrait (60) still seems to think it effective to take one of the most offensive looking sitters he can get, and exaggerate the offensiveness, and Mr. W. Sickert can still exhibit, in "The Boy I Love is up in the Gallery" (73), his diseased sympathy for music-hall ugliness and vulgarity. Among the better works of those which may be said to represent the special tendencies of the Art Club, Mr. Bernard Sickert's "Dover" (45) is a fine broad study of effect; Mr. Mallet's "March Morning" (64) really suggests what the title conveys; Mr. F. Bate's "Over the Whispering Wheat" (83) is a beautiful and refined rendering of a very delicate effect in landscape; and Mr. James L. Henry's "Deal Pier at Night" (87) is noticeable as a moonlight study which looks like moonlight, and does not put in too much detail, as many painters of moonlight are prone to do.

AN AMERICAN ARCHITECT ON RENAISSANCE ARCHITECTURE.

THE following passage forms the conclusion of the fourth of the series of articles by Mr. R. S. Peabody on "An Architect's Vacation," which are appearing in the pages of the *Atlantic Monthly*. This article is in the current number of that magazine, and was referred to briefly under the head of "Magazines and Reviews" in our last issue. While we are being told that the architecture of architects, developed at the Renaissance, is no true architecture and gives no one any pleasure, it may be rather to the point to notice how it affects the mind of an eminent American architect, revisiting it after many years. Mr. Peabody says:—

"As the Renaissance was in its origin a modern movement, so it has remained the foundation for modern art. It quickly established a type for modern palatial architecture in the frowning strength of the Florentine palaces and the dignity and elegance of those of Rome, while the later palaces of Venice, if somewhat vulgar in detail, are still grand and modern types.

In church architecture, however, the Early Renaissance never reached a final or consummate result. At the very outset Brunelleschi gave an elegant Classic dress to the ancient Gothic forms,

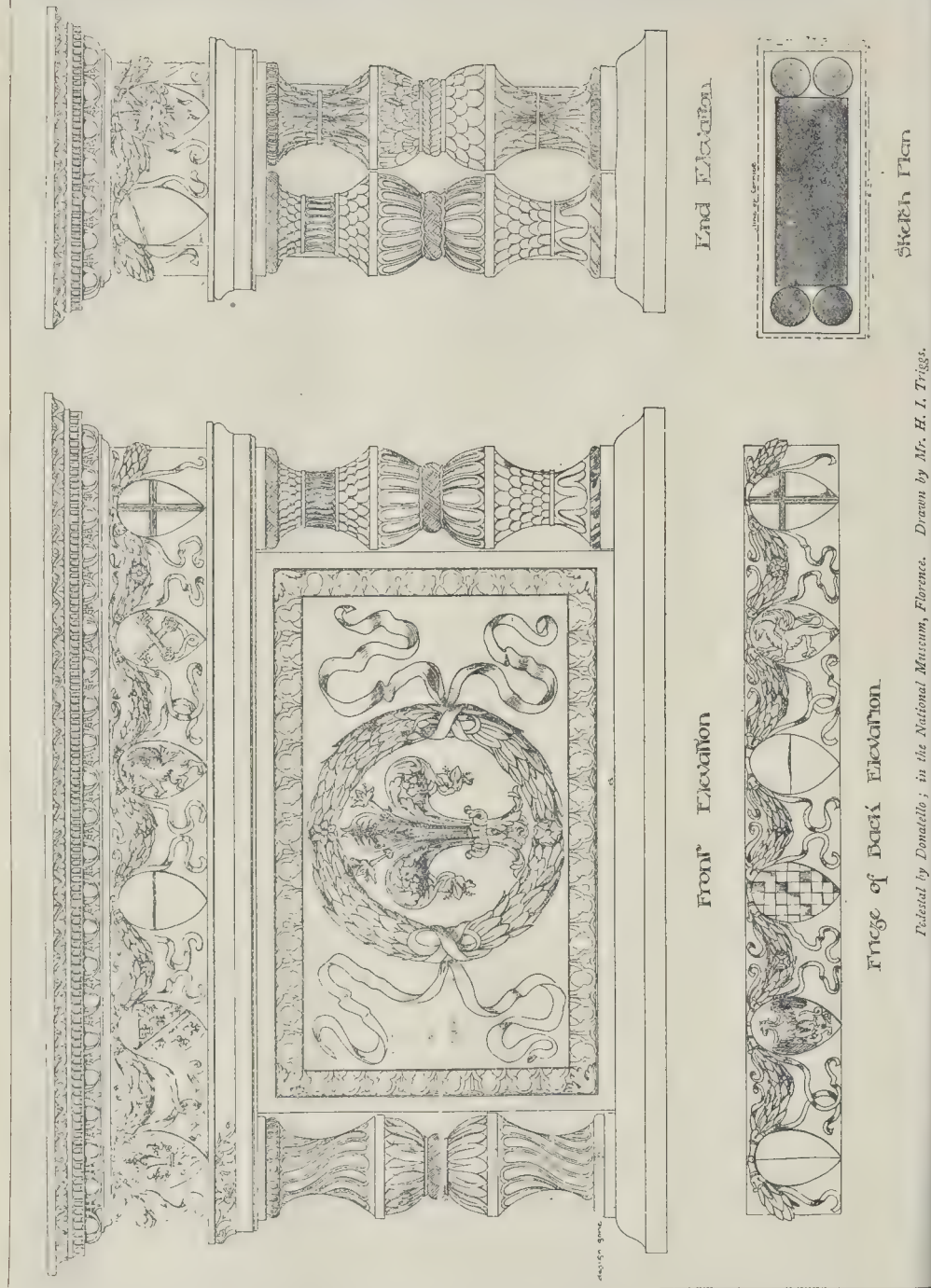
but the most enthusiastic could scarcely claim that he surpassed the Medieval solution of the same problem. Perhaps he intended that colour should adorn those rather chilly interiors; and, set off by gold and fresco, their elegant detail would have given richer results. During the entire Renaissance period the favourite scheme for a church was a domed building with short projecting arms. Around Milan are many dainty examples of this idea, worked out under the influence of Bramante. Indeed, such was Bramante's design for St. Peter's; but one architect after another changed and marred it, and we now can only guess what might have been the perfected result of Renaissance church building.

Our party are all familiar with Rome, but we pass one wonderful Easter Day there; and as we traverse its streets, the whole history of the Renaissance architecture we have been studying is passed in review. Here stand before us not alone the highest results of that art, which, as we have seen, came to Rome from Florence and Milan, but also the ancient classic models which had inspired both Florentine and Milanese. It is a wonderful experience! . . . In crossing the city, our road lies by the great temples and the forums. Accustomed as we are to line-engravings of the orders, and to hearing ancient Roman architecture described as mechanical and inartistic by writers like Mr. Fergusson, it is invigorating to get a fresh look at the real thing. Where will one find a richer, fatter, better carved, or more handsome decoration of any period than that on the remains of such a building as the Temple of Concord? The freedom and juiciness of the Early Renaissance work go back to classic days, and one appreciates in Rome that it is often hard to distinguish between carvings of the two periods.

But our drive extends beyond the Forum, and at last we enter the mighty Coliseum. How humble and minute we feel before the tremendous mass of that immense structure! How small and insignificant seems the work that keeps us awake at night! One irreverent thought alone upholds us. It is a comfort to see that the giants who built it were unable to roof it. A paltry patch of velarium to keep the sun from the emperor's eyes, and which must have been a sad trouble in a gale, was the nearest they could come to our spider-web, wide-spaced roofs.

When we have recovered our breath a little, we continue back by the Forum and the temples and the palaces of the Cæsars to the neighbourhood of the Renaissance palaces, and pay homage to Bramante at the Cancellaria and the Giraud, to Peruzzi at the Massimi, and to Sangallo and Michelangelo at the overpowering Palazzo Farnese. The sun shines brightly as we reach the glorious piazza before St. Peter's Church. The fountains on each side of the great obelisk flash gaily, and men are ringing Easter peals with tremendous clangour on the tower bells as we join the crowds moving up to the doors. It simply intoxicates us all. We have been living in Florence with such austere companions as Brunelleschi and Alberti and Sangallo, with a little merry-making amid the picturesqueness of Siena and San Gimignano, and as we pass through St. Peter's door, and the beauty of those gold-and-white ceilings bursts upon us—the church filled with crowds, the piers decked with red hangings, a great choir singing the service, and a Cardinal at the lighted altar—well, the heart beats fast, and the breath catches with a queer gasp. Mr. Fergusson says that the great pilasters are unmeaning, offensive, useless, and that the window details are in the most obtrusive and worst taste. Doubtless these or other flagrant defects are there, but our little party are satisfied to sit down in a row on the base-mouldings of those very pilasters, and feel humble and modest and small, and thankful for such a day.

The modern painter may be carried away by Parisian technique and passing fads, but for most great and lasting qualities the Renaissance masters still remain to him the Masters. The cleverness of modern writers has not yet made the study of the English of Shakespeare, of Milton, and of the Bible useless to one who would arrive at excellence in literary style. The modern architect, for the same reasons, studies the works of those who were not only the masters of modern architecture, but its very inventors. Our pilgrimage among their buildings is a memory, but we shall not forget the daintiness of the Roman villas or the grace and ornate beauty of the Roman palaces. We have learned respect for the giants who built the Church of St. Peter and the Palazzo Farnese; and we have seen, too, with our own eyes, how closely they were the descendants and the rightful heirs of those earlier giants



who covered the Campius Martius with temple and portico and circus, and adorned the Palatine with palaces; who built the forums and vaulted the baths, and domed the Pantheon; and who raised on its mighty arches the stupendous mass of the Flavian amphitheatre."

PEDESTAL BY DONATELLO.

THE "Pedestal of the Lion," so called from the figure of a lion (the emblem of the Florentine

Republic) which was placed on the pedestal, is a work of Donatello's; the original is now in the National Museum at Florence; there is a copy at the northern angle of the steps of the Palazzo Vecchio, overlooking the Piazza della Signoria. The arms around the pedestal are those of the various quarters or districts of Florence.

The drawing, by Mr. H. I. Triggs, is from the cast in the South Kensington Museum, and was one of the set of drawings for which its author received the Architectural Association Travelling Studentship this year.

NOTES FROM GERMANY.

THERE has been a great increase of theatrical building in Germany lately, though this kind of building enterprise is much hampered by the stringent police regulations as to planning and construction which are enforced both in the provinces and in Berlin. In October a theatre was opened at Bromberg, and another is being carried out at Rostock. Both buildings are from designs of Herr Heinrich Seeling, and are excellent plans. A model German playhouse is to be erected at Eisenach, where classical drama will be produced.

ued on the same lines as at the Wagner theatre at Bayreuth. The capital for this enterprise is 40,000*l.*, most of which will be voluntarily subscribed. The seats (1,200) are arranged at Bayreuth, and priced at one figure throughout the hall. Special attention will be given to the stage machinery. Two new theatres are in course of erection at Berlin, both situated in the west,* or fashionable part of the city, and a large temporary theatre is also being erected in connexion with the Industrial Exhibition. Herr Ehring is the architect of the Exhibition Theatre. He also acts as proprietor, architect, and conductor of one of the former buildings. Of other theatres lately completed, the most important is the Court Theatre at Wiesbaden, of which Messrs. Fellner & Helmer are the architects. A number of theatres have also lately been altered, including the Court Opera House at Berlin, which was closed for some time, and has lately reopened. The old Court Theatre at another is also in the hands of the builder, and the Munich Court Opera House will soon be used for alterations. All these buildings, it could be remembered, are monumental structures of considerable architectural pretensions.

At Berlin, the new extension of the General Post Office is now practically completed. As generally the case with the post-offices in Germany, great pains have been taken to make a block architecturally important, and a model modern construction. The extension, which on a prominent corner site in the Leipzigerstrasse, covers a superficial area of some 5,500 square metres, and has accommodation for the postmaster's office, the book-keeper's department, a number of committee rooms and the post-office museum, together with a number of official tenements, including the residence of the Postmaster-General. The post-office museum has its entrance at the corner, and the galleries are well marked by its facades by their spacious windows. In plan, the museum consists of a covered court for the exhibits, round which the galleries are arranged on two floors and receive a good side light. The Postmaster-General personally presided at the opening of the building, which is only to be termed excellent; and Herr Flake, chief of the Post Office Works Office, was entrusted with the design of the facades, the interior decoration, and the supervision of the work. It is of interest, perhaps, to here add that the German postal service now has 26,000 post-offices and 13,000 telegraph offices, as compared with 4,000 and 1,000 respectively in 1871. The annual number of letters dealt with by the service is 2,984 millions, as compared with 734 millions; and the number of telegrams 31 millions, as compared with seven millions.

The memorial church to the deceased Emperor Frederick, which was recently consecrated with ceremony at Berlin, in the presence of Emperor William and the Dowager Empress Frederick, is situated in the "Thiergarten" or Royal Park. The site was presented to the parish by the Emperor, and the building has cost 26,000*l.*, of which nearly half was raised by public subscription, and the balance voted from parish funds. The foundation-stone was laid October, 1893, so that the work has been just years in the builder's hands. Herr Vollmer, of the Royal Technical College, was the architect, who has adopted an Early Gothic brick style, never known in this country as a "Pomeranian." The plan is a simple cross, and allows for a special pew, directly opposite the pulpit. Special care has been given to some excellent mosaic work, and the joinery of the pews and doors, and considerable sum has been spent on wrought-iron work. Whilst by no means as imposing a structure as the Emperor William Memorial Church, to which we referred in a previous number, the memorial to Emperor Frederick is mainly more in keeping with the wishes of the Emperor than the former place of worship. The numerous monuments which are being constantly built in memory of Emperor William and Emperor Frederick are exactly contrary to the wishes of the deceased monarchs, who always disapproved economical but refined architecture, and who had thoroughly disliked the tawdry and ostentatious shown in some of the German monuments of to-day.

new buildings in the Royal Technical College at Darmstadt, which were opened the week last, have cost 2,063,000 marks, or about 1,000*l.* They consist of a main building, a block for the natural science and electrical laboratories, and a central station for illumination and heating purposes. Professor Gerner and Professor Marx were the joint architects, whose plans were, however, governed by

the wishes of a special technical commission, presided over by Professor von Weltzien. The main block shows in plan the letter E, the two end wings having a length of 72 metres and 42 metres respectively, and the principal frontage being 92 metres, or 300 ft. The situation of the main building is most satisfactory, and its aspect very suitable for the numerous *salons* for which room had to be found. Besides these *salons*, there are a number of lecture-halls and class-rooms in the block, and a very large library has been provided. The architectural rendering of the buildings is by no means as pretentious as the modern colleges at Berlin and other German cities, but the arrangements throughout, including the heating, ventilation, &c., are exceedingly practical. The amounts show that, of the 100,000*l.*, about 50,000*l.* were spent on the main building, and as the contents are about 62,000 cubic metres, this only means a price of about 15*s.* per cubic metre. We must congratulate the architects on successful planning and great economy.

THE ARCHITECTURAL ASSOCIATION: POMPEII.

THE second ordinary meeting of the Session of this Association was held on the 8th inst., in the Meeting-room of the Royal Institute of British Architects, Mr. W. D. Caröe, M.A., F.S.A. (President) in the chair.

The following new members were elected, viz.—Messrs. H. Creswell, F. W. Platt, A. Paul, A. S. Flower, M.A., L. G. Bird, G. C. Carter, F. S. Dawson, C. R. Dibdin, T. T. G. Donaldson-Selby, R. C. Hall, J. C. Hawes, C. Inossi, R. J. Newman, W. C. Oman, S. B. Pridlow, F. N. Reckitt, C. E. Vardell, H. A. Veale, W. S. Weatherley, H. White, W. H. Romaine-Walker, J. Armitage, jun., J. Bevir, H. W. Ford, J. E. Franck, H. L. Goldsmith, C. E. W. Hope, L. C. Gregory, S. H. Hamp, C. H. Isaacs, W. G. Langry, A. C. Little, W. G. Milburn, R. L. Miller, F. G. Newton, B. S. Rodd, E. Rowlandson, H. C. Scott, W. P. Steel, F. C. Wheeler, and L. K. Hall.

Several gifts were announced to the library, and votes of thanks were accorded to the donors. On the motion of Mr. B. F. Fletcher (Hon. Secretary), votes of thanks were passed to the gentlemen who had assisted in connexion with the late conversation, to the different firms who sent exhibits, to the Rebec Orchestral Society, and also to Mr. G. B. Carvill and the members of the Entertainment Sub-Committee, for the excellent way in which they had carried out the arrangements.

The President said that the committee were exceedingly disappointed with the scant attendance at the modelling class. The modelling class, for reasons which he need not detail, was not one of those which came within the scope of the examinations, nevertheless, he hoped it would receive support. They were more and more led to believe it was very important that handicraft should form part of the training of an architect, and one of the most important handicrafts was that which dealt with sculpture, and was most useful to them in the form of modelling. They had a most admirable instructor and learned sculptor in the person of Mr. Pomeroy, and it would be a matter of great regret if they had to discontinue this class.

Mr. Talfourd Ely, M.A., then delivered the following lecture on "Pompeii," with many excellent lantern illustrations:—

It would be impertinent for an outsider like myself to attempt to speak authoritatively before a professional audience on the great problems of architecture, whether ancient or modern—though I have had the good fortune to sit awhile at the feet of such masters of the craft as Professors Hayter Lewis and Roger Smith. As, however, this Association has done me the honour to invite me to read a paper on Pompeii, I will endeavour to place before you, clearly and briefly, the main results of recent scientific exploration of that interesting and fruitful site, and while lightly touching on matters of importance in an architectural point of view, will, as far as possible, add an estimate of the state of pictorial art in that city at the time of its overthrow, and especially of the relation of such art to the masterpieces traditionally ascribed to the Hellenistic age.

This may at first sight appear a presumptuous, if not a hopeless undertaking; but under the guidance of Dr. Helbig much may be learned as to the connexion of the Pompeian paintings with the Alexandrine and the Hellenistic Schools; while the labours of such students as August Mau have rendered it possible

to appreciate the development of wall-decoration from the massive splendour of the Ptolemies to the fantastic creations of Imperial times.

On the present occasion, then, after a slight sketch of the obscure history of the city and its inhabitants, I shall proceed to give some account of the buildings as yet brought to light, and shall conclude with a few words on the importance of Pompeii with regard to the history of art.

In the first place, it must be borne in mind that Pompeii was an insignificant country-town—one of a hundred little centres of life and trade once dotting the rich surface of sunny Campania.

The oblivion that has obscured so many of her quondam rivals might well have extended to Pompeii herself had her fall been left to the ordinary agencies of time and the barbarian invader.

But, paradoxically enough, Pompeii has been preserved by destruction; and the swift annihilation that swept her from the Roman world has enabled us of the nineteenth century to behold her face to face, presenting to us a strange and vivid picture of the life that was lived in Southern Italy well-nigh two thousand years ago.

Pompeii has been called the Brighton of antiquity; Herne Bay or Clacton-on-Sea might have been nearer the mark. Yet the stately fane of Athens, the mighty arches of Imperial Rome can never mirror to us the every-day life of an ancient community as does this petty municipality with the sorry stock-in-trade of her little shops, and the *graffiti* on her walls, apparently fresh scribbled by a passing hand.

Pompeii stood—where it no longer stands—at the mouth of the Sarnus, on the shore of the Bay of Naples, a bay known as the Crater,* or Wine Bowl, not probably without reference to the rich vine lands that surround it. The foundation of the city is lost in antiquity, and its name seldom occurs on the historian's page, though the trade of Nola and the surrounding district must have enriched the little port.

According to Strabo† it passed from the Oscans to the Etruscans and the Pelasgians, and from them to the Samnites, before it was absorbed in the ever-growing Empire of Rome. That it once contained a considerable Hellenic population may be guessed from the remains of its Grecian temple;‡ but it was not a Greek colony as its neighbour Neapolis was.

In the Social War Pompeii took an active part, and was besieged by the great Sulla himself. Eventually the citizens obtained the Roman franchise, but a part of their lands was transferred to the colony of veterans planted by Sulla under the name of *Colonia Veneria Cornelia Pompeianorum*.

After this Pompeii became a favourite resort of the Roman nobility, thus Cicero had his *Pompeianum* villa there, and so had the Emperor Claudius.§

In A.D. 63 the city suffered great damage from an earthquake,¶ from which it had not recovered when, in A.D. 79, it was overwhelmed, together with Herculaneum, by an eruption of Vesuvius, an eruption described by the younger Pliny,|| though without special mention of the towns in question.

The rare occurrence of the precious metals in the *debris* leads us to believe that the ruins were searched shortly after the catastrophe. On the other hand, the diversion of the river's course and the extension of the shore between the sea and the walls, long hindered the identification of the site in modern times.

In 1748, however, the city was discovered; and in 1755 excavation began, in a somewhat haphazard fashion, for scientific exploration dates only from our own day.

The plan of the city is roughly an oval, with a circumference of about two miles. The walls, strengthened with rampart and towers, still gird every side except that towards the sea. As to these towers and the masons' marks on the stones, the student should consult Mr. Fitz Gerald Marriott's recent work, "Facts about Pompeii," which will be found teeming with interesting

* Strabo, 247.

† *Ibid.*

‡ On this building F. von Duhn and L. Jacobi have published a monograph, "Das griechische Tempel in Pompeii," (Heidelberg, 1890). The object of their excavations was to settle the plan of the temple. They found the cella to be not quite in the centre. The nature of the material (tufo) seems to have precluded exact measurement. The columns were placed six at each end and eleven on the flank—an arrangement said to be known elsewhere only in the Metroon at Olympia. They have the rare number of eighteen flutings (pp. 7 and 8). See also Overbeck and Mau, "Pompeii," p. 87. For further researches see Sogliano, in the "Monumenti" of the Accademia dei Lincei, 1890, pp. 190-200.

§ Suetonius, "Claudius," xxvii.

|| Tacitus, "Annals," xv, 22.

¶ "Epp.," vi., 16 and 20.

results of personal investigation. From this we learn that "the towers are not all built on the same plan." They are not actually square, "their greatest length lying at right angles to the wall from which they project at both ends." "Apparently a smaller turret may have existed on the city side of the tower on its roof, covering the top of the stairway that led up to the latter."

It is curious to hear that "no attempt has been made to excavate either" these towers "or the walls, which date from long before the Roman occupation, though the towers date from the time that the walls were strengthened and patched with *opus incertum*."⁴

So Mazois⁵ says:—"La construction de ces tours indique qu'elles datent du même temps que les réparations faites aux murailles."

It is especially on the materials of these walls that Mr. Mariotti has found marks "cut into the stone about half an inch to an inch." They "are 5 in. to 9 in. in height; many of them are like Greek characters." Such marks are found "also on the large stones used for edging the side-walks, as well as on the paving itself, of certain streets."

As a rule the streets are straight, and at right-angles to each other. A notable exception is the chief street, leading to the Forum from the north, which is very crooked, and only 14 ft. wide, including the footpaths. Other streets are wider, but none exceed 30 ft. Vehicles, of course, seldom traversed them. The pavement is of lava.

In succession to the streets of the living—if such a term may be used of a buried city—we may glance at the streets of the dead. At Pompeii, as elsewhere in the ancient world, the roads leading from the gates to the country were lined with tombs. One especially, the road leading to Herculaneum, is most noteworthy, the monuments being still in good condition, though the stucco-reliefs on some have perished.

The public buildings already brought to light include the Forum, an amphitheatre, two theatres, arches, three sets of baths, a basilica, the edifice of Eumachia, and several temples, though not all that are mentioned in inscriptions. Nearly the whole of these had been overthrown, or at least damaged by the earthquake, and their restoration was not completed when the eruption of Vesuvius took place.

The Forum was paved with a white limestone, brilliant as marble, surrounded on three sides by a Doric portico, and adorned with statues, the marble pedestals of which still remain.

The names of most of the buildings in the neighbourhood of the Forum are very doubtful. Thus some have denied that the temple of Jupiter is a temple at all; while the large temple assigned to Venus was probably in reality dedicated to Apollo.

The largest of these buildings is the Basilica, 220 ft. in length by 80 ft. in breadth, on the western side of the Forum, with which it is connected by five doorways. Its roof was supported by Ionic columns of brick coated with stucco. Though called a Basilica, it lacks the usual apse. It possesses, however, a raised tribunal. An inscription proves that it was erected before B.C. 78.

One only of the temples is purely Greek in style. Its scanty remnants show that it resembled the great Doric temple of Poseidon at Prestum, built about 500 B.C. The paucity of remains suggests that this Greek temple was not restored after the earthquake.

All other temples yet discovered at Pompeii stand raised on the Roman *podium*.

The flutings of the columns are generally filled up with stucco for one-third of their height; and this part is painted with red or yellow ochre.⁶

It appears that there was no good building-stone at hand, and marble was scarce.

Tufa seems to have been used throughout the existence of the city.

Limestone was used for private houses of early date, but not exclusively, the upper part of the building being of framework.

The material of the peripteral Greek temple was tufa, with limestone capitals, the difference between these and the tufa shafts being concealed by a thin coating of stucco. In the Basilica both limestone and tufa were employed, and later repairs were executed in brickwork.

It is, however, in her private houses that the

unique interest of Pompeii is centred, and I will now turn to them, following for the most part the excellent treatise of Von Rohden in Baumeister's "Denkmäler des klassischen Altertums."

The earliest Italian houses were huts—originally circular, then oval, finally rectangular; with high-pitched roof, from which the water flowed outwards as in our buildings. Such houses are hardly to be found in Pompeii, where the *atrium* is the characteristic type—the *atrium* in which the rain is led inwards, for with neither the *atrium displuvium* nor the *testudinatum* are we now concerned.

Of the five varieties of *atria* mentioned by Vitruvius, the other three have the roof sloping inwards down to an opening called *compluvium*, from which the water fell into the central *impluvium*. In the *atrium Tuscanicum*, the earliest and commonest form, the roof was supported simply by four cross-beams at right-angles. More space was gained by the introduction of the *atrium tetrastylum*, in which the roof was supported by four pillars at the corners of the *impluvium*.

In the *atrium Corinthium* the space was still further enlarged by the addition of more pillars. The *compluvium* admitted light and air, windows being scarce, for glass was not commonly used for such purposes in Pompeii, though frequently found in the later houses of Roman Britain.

The oldest existing Pompeian houses, those of the fourth century B.C., were built of limestone, without mortar, the joints being filled with clay. The "Casa del Chirurgo" is an example. They were in their original state of only one story, and had no columns.

In the next period the building material was tufa, which better admitted of ornament, as in the case of the columns, which were now introduced under Greek influence. Limestone, however, was still employed for door-posts and to support heavy weights, as the main beams of the roof.

The introduction of columns to support the roof encouraged the striving after additional space that seems to have characterised this tufa period, when houses were extended towards the back, colonnades being built round the garden to form the private part of the dwelling.

In the early days of Pompeian excavation less attention was paid to the houses than to their contents. Fiorelli, however, saw that the buildings themselves should be preserved. He put in new woodwork, supported walls, and, in the "Casa del Balcone Pensile," succeeded in rescuing from destruction an actual instance of a *Mantuanum*, or projecting upper story. That upper stories existed throughout the city is proved, indeed, by the constant occurrence of stairs; and Dr. Middleton, in the "Dictionary of Antiquities," goes so far as to assert that "one-storied buildings were practically unknown in Pompeii."⁷

Buildings depicted on some of the walls, have attics besides ground and first floors.

Though it is not probable that, in height, the houses of this provincial town rivalled the vast *insula* of the capital, with their series of flats rising to 70 ft. or more, yet five-storied houses, placed against the southern cliff of the platform on which Pompeii stands, have lately been excavated; and we may suppose that, as at Rome, the old-fashioned roomy *domus* of the family, with its *atrium* of wide-spreading colonnades, might soon have given way to the lofty block of hired apartments lighted from the street.

As the citizens lived much in the open air, the closed rooms are small, the kitchens especially. Of cellars there are few.

Flooring, except upstairs, was seldom of wood, often some species of mosaic pavement, as the *opus Signinum*, which consisted of small pieces of tile (for which Signia was famous) and stucco well-rammed.⁸

Occasionally, the finest examples of mosaic decoration are found in these floors, as the celebrated representation of Alexander and Dareios, undoubtedly copied from a Greek painting of high rank, probably Helena's picture of the battle of Issos.

Far more important are the walls of Pompeian houses, or rather the paintings with which they are decorated; for, apart from their value as reflecting the lost paintings of the Greeks, they enable us to trace with considerable accuracy their own history and that of the buildings in which they are found.

The upper story of the Casa del Chirurgo belonged to Roman times. Overbeck ("Pompeii," p. 280 of the fourth edition), says, "Das alte Haus hatte ursprünglich nur ein Erdgeschoss."

¹ Ibid., p. 679.

² See Bolton, "Examples of Mosaic Pavings," p. 2.

³ Vitruvius, vii., 5.

⁴ "Technologie und Terminologie der Gewerbe und Künste bei Griechen und Römern," iv., pp. 444, 445.

⁵ Vitruvius, vii., 5.

⁶ Technologie und Terminologie der Gewerbe und Künste bei Griechen und Römern, iv., pp. 444, 445.

⁷ Ibid., p. 679.

⁸ See Bolton, "Examples of Mosaic Pavings," p. 2.

Diverse as are these paintings in subject and execution, there are certain principles common to all.

The walls are covered with stucco, and on this are painted the various pictures and ornaments. The painted wall-surface is horizontally divided into three parts. There are also perpendicular divisions, of which the central one is marked off as the principal field for pictorial display. A certain similarity of decoration is accounted for by the fact that the great majority of the paintings belong to the period subsequent to the earthquake of A.D. 63.

As to the chronological sequence of these paintings, the researches of August Mau have enabled us to distinguish four epochs.

The palace walls of the Ptolemies and other Hellenistic princes were lavishly adorned with blocks of rare and costly marble of various hues. At Pompeii, in the second century B.C. and the beginning of the first, this "Incrustation-style" was imitated more economically in coloured stucco. This style, with its protruding blocks, was not adapted for paintings, so pictorial decoration was confined to mosaics on the floor. Such projecting blocks made rooms actually smaller. In the succeeding "architectural style" they were apparently increased in size, several planes being represented by the help of perspective, and the projecting parts being expressed by shading.

The imitation of an easel-picture on the wall became now the dominant centre to which the painted blocks and the architectural forms of the earlier style simply served as a frame. Thus from the time of Sulla to the Christian era, the older elements of decoration remained in use, but were relegated to a subordinate position.

For the succeeding half-century the "Kar delabersil" as Mau calls it, prevailed, in which slender candelabra form a characteristic means of dividing the main fields of the design.

In this "ornamental" style of the early empire all suggestion of squared stone blocks has disappeared. The plinth no longer appears to project beyond the middle surface, and the strongly marked cornice above this middle portion of the wall is replaced by a small ornamental band.

Whereas the centre of the wall in the second style was represented as a sort of pillared hall, the background of which the picture was introduced, now, in this third style, the building is set aside, and the columns with the epistyle form only a frame.

The plinth and the main field of the wall surface have their cornices replaced by a narrow band of bright colour, decked out with daintily ornaments.

Above the main field is a frieze, generally black on which are painted little objects of endless variety.

The third or uppermost division of the wall contains, as a rule, slight ornamental architecture in dull colours. Much naturalistic foliage is employed. As to colour, there are many shades of tone, e.g., many shades of red.

The plinth and the frieze are generally black as are often the small panels.

The colours of the upper portions are lighter, the chief characteristics, however, are the white or whitish pillars and candelabra.

But the careful execution and sobriety of taste in this ornamental system did not satisfy the Post-Augustan Age, an age that demanded warmth of colour and startling effect. The wall was now apparently broken through, numberless fantastic and impossible buildings were depicted through which one looks out into the open air. In these airy buildings are figures. Slenderer need duty for columns—fanciful oddities—monstrous

Vitruvius calls them—"crowd the wall—creatures that never existed—nor could exist."

The old painted cornice is now replaced by plastic one of stucco. Figures are larger than before; and a broad lattice or trellis ornament—a staple characteristic of this fourth and last style, which prevails above all others in Pompeii.

Such are the four epochs of Pompeian wall painting. As to the technical process of the execution most may be content to follow Donne. For my own part I incline to refer to one of the most trustworthy of our own archaeologists, my friend Mr. Cecil Harcourt Smith, whose article "Pictura" in the new edition of the "Dictionary of Antiquities," based on the researches of Blümmner, gives a clear and reasonable account of the methods probably employed.

In the first place, it is certain that the ancient used for their fresco-painting much thicker and

* "Facts about Pompeii," p. 36.

¹ *Op. cit.*

² "Les Ruines de Pompeii," i., p. 36, note 2.

³ Von Duhn and Jacobi consider the question of the age of the Pompeian Greek temple an open one (*op. cit.*, p. 14), but suggest that it may belong to the fifth century, or even the fourth (p. 16). They consider that the temple fell in the second century (p. 18).

⁴ In the newly-excavated house of A. Vettius this is not the case.

more carefully-prepared layers of mortar than the moderns, and were, therefore, less trammelled by rapid drying.

"The water of the water-colours," writes Mr. Smith, "combining with that already existing in the mortar, releases a part of the hydrate of lime (into which the lime in the mortar has changed by slaking), and pressing through all the layers of colour, after an interval, turns to the surface; here it attracts to itself carbonic acid from the air, changes again into carbonic acid lime, and is deposited over the colours in the form of a thin crystal skin, which is hard to dissolve, and strengthens and protects them in such a way that washing (without friction) causes no injury."

Some colours, however, required a medium such as milk or gum to fix them.

On the difficult question of encaustic painting, much light has recently been thrown by the discovery in Egypt of several mummy portraits executed by this process. That in producing these portraits melted wax was laid on with a brush, has been clearly shown by Prof. Flinders Petrie. A further and a far more interesting question remains to be considered, the subjects of the more important pictures and the source of their inspiration. Greek painting, from its perishable nature, as been little more to us than a tradition. With the sister art of sculpture, time has dealt less harshly. If we cannot with certainty say this or that statue is from the hand of Pheidias himself, we may at least point to a brilliant series of plastic works of the highest rank, executed under his immediate supervision, and forming part of the greatest sculptor's harmonious design.

Of Pausanias and of Praxiteles we have actual masterpieces. Myron's style is reflected in the statue of no mean order; while the chariots of the Mausoleum and of Pergamon worthily represent respectively the plastic art of the fourth century and of a later school.

The great painters of Hellas, on the other hand, are little more to us than the echo of a mighty name. The glories of Polygnotos have perished with the walls they clothed. For Alexander's likeness we are indebted not to a pelles, but to nameless engravers of coins. The arrogance of Neuxis, the vanity of Parrhasios, are all that is really known of these men, so famous in their day.

As to their successors, however, Timanthes and Mikias, Aëtion, and Theon, and Timomachos, much light has come to us in these latter days from an unsuspected source. The critical cumen and patient labour of the great archaeologist Helbig—"quem honoris causa nominamus"—have established the intimate dependence of the best Campanian paintings on the works of artists famous in the Hellenistic age, and the close parallelism of both with the idyllic poetry of that prolific period. The copyists vary, of course, in fidelity to their originals; thus the Medea from Herculaneum, represented as pressing her thumbs together, is probably nearer the original of Timomachos than the Pompeian Medea grasping the sword.

Naturally, there is but a limited number of cases in which such relationship can be definitely asserted. On this subject, however, I may perhaps be allowed to quote what I have written elsewhere.

"For the various pictures the student should take Helbig for his guide, who has enumerated nearly two thousand in his catalogue, a number now increased by some hundreds. They do not effect to us the art of periods earlier than Alexander, an art that introduced men only as occasion required, and did not favour *genre* representations. They rather reflect the art of Hellenistic times with its fondness for actual life, children sporting, &c. The art of Pompeii possesses little of the dramatic. It is rather idyllic, and smacks strongly of the Alexandrine poetry. In the whole number of pictures there are only two that can be called historical—the death of Sophonisba, with its portrait of Scipio, and a rough sketch of the fracas in the amphitheatre between the Pompeians and the men of Nuceria. Of the few that can reasonably be traced back to great originals, perhaps the most interesting is the Medea, that may well be descended from the masterpiece of Timomachos. The bulk of the representations are mythological; not dealing with the greater gods, except Apollo, Aphrodite, and Dionysos, but with Eros, Nike, Nereids, the attendants of Dionysos, and some of the heroes, as, notably, Herakles. The rare occurrence of

Italian myths is accounted for by the lack of established types to copy. The failure of pictorial power, attested both by Pliny and Petronius,* must, however, refer to conception rather than execution, which was still good, as we see by the wall-paintings, though these can give only an approximate idea of the contemporary easel-painting.† These mythological pictures, with their tendency to the beautiful, together with some general types of mankind and scenes from comedy, which are rather characteristic than beautiful, form one of Helbig's‡ two great divisions—the *ideal*, in which there are many replicas; and the *realistic*, in which there is only one example of each composition. These realistic pictures were less carefully executed than the ideal, and occupied inferior places. The best belong to the amphitheatre, and represent gladiators and wild beasts. Of ideal representations few are derived from epic poetry, which required a larger field, with many figures. Most are quiet or sentimental subjects, akin to those of idyllic poetry, as the "Lovers with Nest of Eroses." In landscape we find oftentimes a smiling Nature covered with the works of man,§ in which we may sometimes recognise the west coast of Italy, between Ostia and Salerno, and an illustration of Pliny's description of his villas. The important position of landscape in modern art, however, was never reached in antiquity. Ancient art was essentially plastic, and knew little or nothing of atmospheric effects. In delicate grace and lightness of pose the decorative figures hovering on the Pompeian walls have never been surpassed.

For purposes of decoration the wall was divided into separate fields, the centre of each field being formed by a picture bounded by a painted frame. This was an imitation of the separate pictures on panel, and in some cases the picture was actually painted on a separate piece of stucco. In the tent of Ptolemy Philadelphus there were real panel pictures between pilasters. These luxuries were confined to the few, and in the Campanian cities such pictures and pilasters were imitated in wall-painting.¶ Many of these Campanian paintings are of Hellenistic origin. Thus the Herakles with Telephos from Herculaneum, goes back to a work of Pergamene art, and is illustrated not only by coins, but by the smaller frieze from Pergamon, now in Berlin.

Another clue to the great paintings of the fourth century has been found in mosaics. The mosaics of Pompeii are chiefly decorative; one, however, undoubtedly is copied from a Greek painting of a high rank—the mosaic of Alexander and Dareios.¶ The moment chosen is one of intense interest. Alexander, charging the Persian body-guard, transfixes with his lance the Persian noble who has thrown himself before his king. Dareios stands helplessly in the chariot, which the driver vainly seeks to disentangle from the *melée*. In the horse brought up for the king's escape we see the boldest foreshortening; and the face of the Persian reflected in a shield is another instance of technical skill. So excellent a copy implies a great original, and we can hardly be wrong in seeking that original in the famous picture of the battle of Issos, by Helena, daughter of Timon.** Not to her pictorial treasures alone, however, does Pompeii owe her pre-eminence among the deserted cities of the ancient world. Her bronzes and other ornaments are of the greatest variety and beauty; but it is rather the abundant traces of human activity and traffic seemingly but this moment stopped that raise such vivid emotions in the traveller's breast.

At Delos, richly-decorated houses, dating from the first century B.C., have been brought to light by French explorers. To the historian, according to Prof. Freeman, "Ostia is becoming a fair rival to Pompeii."†† But we are not all historians, and to the ordinary man with ordinary sympathy for his fellow man, the human interest of Pompeii will appeal with the greatest force.

Mr. A. B. Pite, in proposing a vote of thanks to Mr. T. Ely for his great kindness in preparing so interesting a lecture, said they had something

more to do than simply to express their thanks; they had also to convey their very great sense of the pleasure with which they had listened to it. They came there on serious thought intent for the purpose of profit, and they had taken their dose of profit that evening in an exceedingly pleasurable manner. They had had an object-lesson from ancient life which had been profitable, and almost with the art of a novelist Mr. Ely had enabled them to live and move in thought in the past. In this nineteenth century they had almost felt it possible to live in that Pompeii which had been revealed to them. It was exceedingly singular, and it came to him with remarkable force, that amid all the advances of civilisation and the developments of science and learning, architects were architects still, exercising their art upon the same materials as of old, just in the same way, he believed, as shoemakers were still shoemakers. They went back into far distant epochs and found their forefathers building in brick and stucco and painting; and that they had really the same problems to deal with as existed in the present day. It was interesting and pleasing to feel that they had a brother who understood something of their daily practice of the arts in a skilful antiquarian who could live himself in the age that had long passed away.

Mr. G. H. Fellowes Pryne, in seconding the resolution, said that they felt grateful to Mr. Talfourd Ely for not having read his paper in a formal way. The manner in which he had delivered the lecture was thoroughly interesting, and caused them to enter into the remarks with very much more zest than had it been delivered formally. It was a common saying that a great man's deeds were more appreciated when he was dead, and certainly they had been having the works, if not the deeds, of the people of Pompeii brought before them in the most vivid way. One could not help feeling some comfort in looking at these pictures and seeing that in so early a period stucco-work was taken advantage of; and that after seventeen centuries it had been excavated, and they were able to actually find the work very much as the workmen had left it. It would be hard indeed, he believed, to go into any modern city, or find a modern town, which could compare in any way in interest with Pompeii—with its theatres, its brilliant shops, its forum, and its temples. Let them think of a suburb of London, and imagine it for a moment destroyed—what would remain of it seventeen centuries hence? One was interested to find the close connexion which Mr. Talfourd Ely drew between the reflection of the art from Greece, in the sacrificial picture, which showed that the connexion was closer than they had generally been led to believe. They must feel in England that the subject was one which really deserved far more interest than they, as architects, had been able to give it, and he hoped that when the members of the Architectural Association went to Italy again they might have a chance of visiting Pompeii.

Mr. FitzGerald Marriott said that Mou was a personal friend of his, and had been the first, amid a good deal of ridicule from outsiders, to distinguish the four styles of decoration. This was not simply guess-work; he had pointed out clearly the gradation between the first, second, third and fourth styles, each with its own period. In the third style there were three varieties, and in the fourth a very large number. In the few ancient cities of Italy which had not been destroyed, there was a probable continuation of these last, which doubtless had developed until modified into what is now seen in our century, viz., a few daubs on each wall. He knew several small ins in Italy with trellis work painted on the walls, which is also one of the last and lowest stages found at Pompeii. Sogliano, the present director, had done an enormous amount of good work in the last few years. Sogliano was for a long time inspector, but with little power, and was, he believed, unknown in England, though he possessed everyone's confidence in Italy. The investigators in Pompeii were only allowed 3,000 francs per annum, and yet the work had been done in a magnificent way, the last house, viz., that of Vetius being the finest house yet partly restored. The roof had only been put on to keep the rain from injuring the fresco. It was full of rich marble, and contained five pictures which had never been seen before in Pompeii. One represented the death of Pentheus, a subject he believed formerly unknown there, while another showed Dirce being tied to the bull, the same subject as the *Toro Farnese*. They would have noticed that one of the views thrown on the screen had shown how the site of the cliff could

* The language of Petronius ("Satire," 88) is very strong—"Cepti . . . causam desiderii presentis ex-cute, cum pulcherrime artes perissent, inter quas pictura me munant quidem sui vestigium reliquisset."

† Helbig, "Camp. Wandmalerei."

‡ *Ibid.*, p. 66.

§ *Ibid.*, p. 99.

¶ Helbig quotes Plautus, "Menæchmi," I, 2, 34, and "Mercator," II, 2, 42, 44, to show that the fresco process was established in Italy in the second half of the third century.

† See the coloured plate facing p. 612 in Overbeck's "Pompeii" (fourth edition).

** Some refer it to Philoxenos of Eretria.

†† "Studies of Travel—Italy," p. 102.

* Hawara," pp. 18, 19.

† "Manual of Archaeology," pp. 218-222.

‡ C. Tacitus "Annales," xiv, 17.

be utilised for building a high house in tiers. When they came to the top of the cliff they had there the ordinary sized house of Pompeii, and thus the architect had been able to get six to eight stories in tiers, the one behind the other. He did not think that he could add anything further to what Mr. Talfourd Ely had said, but he must thank him, the Chairman, and the whole Association for having so kindly allowed his book to be mentioned, and some of his illustrations thrown upon the screen.

The President said that after the very interesting remarks that had been made he felt that many words from him would be superfluous. At the same time, as they were practical architects, it was well they should consider what bearing every portion of past art had upon the art of the present day, and they might regard the art of Pompeii, which had been so finely preserved, in that light. Mr. Talfourd Ely had specially noted the point that there was a great deal of what he was pleased to term "sham" done at Pompeii. He supposed there was no greater opponent of sham than Ruskin, the purist of the purists, but in discussing the general question of shams he had properly reminded them that in dealing with domestic decoration a more playful and freer treatment of art and of decorative art was allowable than would be the case with public buildings. If Ruskin had gone to Pompeii as his precedent he could not have had a better example, but he believed he went for his precedent to the Renaissance. There was no doubt that they might be playful, and, provided it was done with a certain regard to principle, they might even engage in making sham windows on walls with sham people looking through them. He was bound to say that the art of Pompeii had always struck him as being not very refined, and he was not quite sure that it had not had a somewhat deleterious influence upon what he might call the commoner forms of decoration. The influence might not have come so far as this, although a well-known adaptation of the Pompeian decoration in a London theatre could not be called altogether successful. One saw this influence very much in Germany and Austria, and to some extent in Italy, although the Italians were so realistic that perhaps they did not think of the past of Pompeii. In Germany, however, the attempt to produce ideas of sham perspective and so forth gathered from Pompeii, were very unsuccessful. There was one little point which Mr. Talfourd Ely might perhaps enlighten them upon. He was struck with two drawings in Mr. Marriott's book which appeared to show labels over the windows. In one case it looked as if the work might have been done in the twelfth or thirteenth century, and it would be very interesting to know if the Pompeians had adopted the idea of a label over the arch.

The vote of thanks, on being put to the meeting, was very cordially received.

Mr. Talfourd Ely, in replying, said that with regard to the last point he was afraid he could say but little. It was undoubtedly the case in Pompeii that there was a tendency to inscriptions, and one of the most curious was in the case of an inn or tavern, where there was a very vivid representation of what would now be called a "chucker-out." There was a representation of a pair of men beginning to quarrel over their cups, while another man was pushing them and saying "Go and fight outside." There were also many inscriptions of a political nature. Mr. Marriott had referred to one matter he had never thought of, viz., the modern decoration of the Italian inn, which had doubtless descended from the ancient times to which they had been referring. He remembered being much struck with it when he first entered Italy. No doubt it was common and plain enough, but it was an attempt to make the rooms bright and cheerful.

The proceedings then terminated.

ANCIENT CRYPT, WHITEFRIARS.

UNDER the west end of Britton's Court, a narrow *cul-de-sac* on the west side of Whitefriars-street, Fleet-street, is a very perfect and interesting crypt, probably part of the destroyed monastery of the White Friars or Carmelites. The existence of this crypt or sub-vault has long been known to a few antiquaries, but has recently come into public notice through attention having been called to it. It is entered from the cellar of the house No. 4, on the south side of the court, by an awkwardly-placed hole, close to the cellar floor. The crypt stands east and west, and is about twelve feet square. The walls are well built of clunch masonry; and from them spring,

without corbels, seven (but originally eight) freestone ribs, which converge upon a central boss carved with a large rose. The eighth rib, that from the south-west angle, has been cut away, with much of the angle itself, when the present house was built. The cells of the vault are filled in with blocks of clunch. There are no signs of windows or other openings in the south, east, or north walls, but in the west wall, towards its north end, is a small pointed doorway opening into a passage which curves round towards the north. Further investigations in this direction are probably impracticable through the adjoining property belonging to another owner. Both walls and vault, with the exceptions already noticed, are in a singularly clean and perfect condition, and show no traces of the usual Medieval whitewash. The floor level is at present covered by an accumulation of earth and rubbish. A good deal of this has, however, been taken out and carefully sifted, with the result that a large number of fragments of pottery and other relics have come to light. The pottery is chiefly modern, but there are pieces of all dates as far back as the early part of the sixteenth century. The relics include such miscellaneous articles as a curiously-shaped pattern iron, a wig-curler, a horseshoe, a modern electro-plated teaspoon, &c. The construction and architecture of the crypt closely resemble those of the vaulted basements of the Westminster Abbey buildings on the east side of Dean's-yard, and, like them, the crypt is almost certainly of late fourteenth-century date. It would be useless to speculate as to which part of the Whitefriars Monastery it belonged, since the general plan of this is unknown. The crypt clearly owes its existence to its position under the court, where it had escaped being destroyed to make way for buildings. Another crypt of the same character on the north side of the court is said to have been destroyed some eighteen years ago, when the modern premises there were built. There is no present danger of the existing crypt being mutilated or injured in any way.

THE NEW BUILDING OF THE INSTITUTION OF CIVIL ENGINEERS.

THE opening meeting of the Session was held in the new building, as altered and enlarged under the direction of Mr. Chas. Barry, on Tuesday night, though everything except the large meeting-room was in a very unfinished state. The meeting-room is within its old walls, but both floor and ceiling have been raised, and the design altered. The lower order of pilasters has been necessarily removed from the wall, owing to the raising of the floor, and the lower portion treated as a high dado, the upper pilasters remaining. The ceiling is richly treated, with a large cantilever cornice, and a central dome of stained glass; a small semi-dome on each side of it forms a centre for the pendant electric-light globes, another of which hangs from the centre of the glass dome. The floor is at present flat; there is a question whether it should be raised (stepped) from front to back, and we should certainly recommend that this should be done, as it is very seldom that the room is wanted for any other purpose than a lecture-room, and the stepped floor could easily be made removable.

The library, which occupies the front portion on the first floor, with a large range of windows towards Great George-street, will be a very fine room when finished; at present it is only in a shell state. It will afford space for 56,000 volumes, double the number in existence at present, so that plenty of room is allowed for its future extension.

Of the exterior façade we gave an illustration in the *Builder* for June 22 of this year, to which we may refer the reader. A full description of the arrangement of the buildings, materials used, &c., was published along with that illustration, so that it is unnecessary to repeat it here.

INSTITUTION OF CIVIL ENGINEERS.

THE first meeting of the session 1895-96 of this Institution was held on Tuesday, when a portion of the new building, comprising the theatre and approaches, with tea-room, &c., was made available for the purposes of the evening. The chair was taken by Sir Benjamin Baker, K.C.M.G., LL.D., F.R.S., the new President, who delivered his inaugural address.

After some preliminary observations referring to the position of the Institution in the domain of engineering, and the necessity of British engineers acting together in a true spirit of comrade-

ship throughout the world, the President proceeded to discuss the question why engineering, unlike other liberal arts, was an essentially modern profession. Was it because the modern demand for rapid transit, often as purposeless as that of a record-breaking bicyclist, had not its equivalent in the past, or was it because our ancestors lacked the inventive power and mechanical ingenuity of the present age? The artificers who built the highly ornamental barge in which Columbus blundered across the Atlantic could, with the same materials and workmanship, have constructed a clipper ship, capable of sailing three hundred miles in a day, but no one asked for speed in those days. On the other hand, although the present was pre-eminently an age of invention, an impartial survey of actions and events recorded in history would satisfy most people that in all ages there were to be found men no less intellectual and enterprising than ourselves. The general answer to the question raised would probably be that as it was only in the present century that people had insisted upon rapid locomotion by land and water, so it was the necessity of meeting that demand which had created the profession of modern engineering. When Watt directed his attention to the steam-engine, the country was weary of wars, and longed for the advancement of its material prosperity, and so a demand was created, and the country quickly became covered with canals, roads, and factories. At that time England depended largely upon her American colonies (now the United States) for the supply of iron, and in 1751 an act was passed admitting American bar-iron duty free to London, but prohibiting its cartage therefrom to Birmingham, as it was desired to make London, instead of Birmingham, the chief seat of the iron manufacture of the country. No one foresaw that Great Britain was to become the leading iron-producing country of the world. On all subjects, indeed, the most eminent men constantly failed in their forecasts. Smeaton did not believe in the steam-engine as proposed by Watt; Telford had grave doubts as to the practicability or usefulness of the Liverpool and Manchester railway; Sir Robert Peel, sixty years ago, blocked a proposal in Parliament to make all the railways seeking access to London adopt a comprehensive plan for a central exchange station, so that through passengers and mails might be saved cabbing across London; Lord Brougham tried, in 1857, to make thirty miles an hour the statutory limit of speed on railways; Lord Palmerston told the House of Commons that the Suez Canal was one of those bubble schemes often set on foot to rob the English capitalist, and even Robert Stephenson, following him, declared it to be, commercially speaking, impracticable. All these mistakes, however, became insignificant when contrasted with the gigantic blunder, acquiesced in by the whole civilised world, of assuming, at the time of the Great Exhibition of 1851, that the efforts of the engineer would effect an immediate change in the long inherent savagery of mankind, thereby inaugurating a period of universal brotherhood and peace. Civil engineers were often reproached for devoting their ingenuity to the devising of man-killing appliances, but with little reason, for no one could fail to see that whatever might be the abstract principles of Christianity, in practical politics they were disregarded, it being always taken for granted that if a nation possessed that which another nation might covet, it must be prepared to defend its possession at the point of the sword. It had been frequently assumed that everyone acknowledged the benefits conferred upon humanity by engineers in facilitating communication, cheapening production and raising the condition of the toiler; but the late Professor Froude had publicly stated that he failed to see much evidence of progress in the nature of men, and that "Even in the outward essentials of food and clothing and housing it is not certain that the mass of mankind in the present generation are better off than their forefathers." The President was not prepared to accept this dictum, and maintained, on the contrary, that the mass of mankind were much better off than their forefathers in these respects. Further, that the independence of the labourer and mechanic had been greatly advanced in consequence of the vastly-increased demand upon their services due to engineering work. In support of this view, it was stated that as recently as four years after the opening of the Liverpool and Manchester Railway, certain Dorsetshire labourers ventured to erect themselves into an elementary form of trade union, and were sentenced to seven years' penal servitude for their pains. At the present time many municipal contracts provided for payment of wages at trade-union rates, whereas a couple of centuries ago the magistrates fixed the rate at Quarter Sessions, according to the price

food and clothing, the average being about 1s. day for carpenters and masons, and 8d. for labourers. The hours of labour for all classes are from 5 a.m. till 8 p.m., with 2½ hours interval for meals and rest. The penalty for an employer who departed from these regulations is ten days' imprisonment and 5s. fine, and for workman twenty-one days' imprisonment. No man in search of work could beg without a license, the statutory penalty for a first offence being whipping at a cart's tail; while the second offence meant the loss of an ear and 10 days' scourging, and the third hanging. In the whole, the study of the past was inclusive as to the material and moral progress which had accompanied the development of engineering works. The President next dwelt on the work done by physicists in the borderland of engineering, and expressed the opinion at long before the coalfields were exhausted no way would have been discovered of tapping the inconceivably great reservoirs of force in the earth still untouched. Although no one could foresee the demands of the next age, new wants instantly arose, and new branches of engineering resulted from apparently trivial laboratory experiments. In conclusion, the President issued a note of warning against the growing position to overrate technical education. Education would do much, but it would not endow a man with common-sense, nor would it make his nation on a multitude of important subjects more than that of any naturally observant man. There were not wanting contractors and manufacturers who contended that some of the best-trained young engineers of the present day were not wholly free from a tendency to overmuch reliance on formulas, without due regard to the efficiency of the data upon which such formulas are based. Such faults were best remedied by training in practical discussions with other engineers, such as it was a province of the Institution of Civil Engineers to encourage.

After the delivery of the address, the President presented to the recipients or their representatives the medals and premiums awarded for papers read last Session or printed in Section II. He then adjourned till the 19th inst., when it was announced that the following paper would be read:—"The City and South London Railway, with some Remarks upon Subaqueous Tunneling (Shield and Compressed Air)," by Mr. J. H. Athead.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday, in the City Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Victoria Embankment Store-yard.—The Highways Committee recommended:—

(a) That a portion, 20 ft. wide, of the land now used as a store-yard on the Victoria Embankment, be added to the public way. (b) That, subject to an amendment being submitted to the Council by the same Committee as required by the statute, a 9 ft. in height, with entrance-gates at the end of the Charing Cross Station of the District Railway, be erected around the land, at a cost not exceeding £800, and that the land to be added to the public way be paved, and a draw-in to the new space to the yard be provided at a further cost not exceeding £200; that the plans and estimates referred to the Works Committee, with the view of the work being carried out without the intervention of a contractor; but that in the event of the Works Committee not being satisfied of the sufficiency of the estimate, the Highways Committee be authorised to obtain tenders.

Mr. John Burns, M.P., opposed the recommendation, and said that the Works Committee should follow the example of the City Corporation, and store their vehicles and street sand at their depot in Lambeth.

Mr. Emden said that if the land was thrown into the public way, a nuisance would certainly be created.

Recommendation a having been agreed to, Colonel Ford moved to refer back the second recommendation.

The amendment having been seconded by Mr. Burns and supported by Mr. Beresford Hope, it was, on a division, lost by a majority of 31, and the report of the Committee was adopted.

Tramway Purchase.—Mr. N. W. Hubbard, Chairman of the Highways Committee, moved:—

(1) That a notice in writing under the seal of the Council be served upon the London Street Tramways Company requiring the company to sell to the London County Council, under the conditions and

in the manner provided by Section 43 of the Tramway Act, 1870, the tramways and works and undertaking authorised by the Tramways Orders Confirmation Act, 1874, as altered and amended by the London Street Tramways (Extensions) Acts, 1884, 1885, and 1887, and any other Act or Acts altering and amending so much of the said Act of 1874 as relates to the undertaking of the Company.

(2) That the Clerk be instructed to apply to the Board of Trade for its approval of the terms of the foregoing resolution, and to serve the notice therein referred to so soon as the Board of Trade shall have signified its approval.

(3) That it be referred to the Finance Committee to take the necessary steps to obtain the insertion in the Council's Money Bill of 1896 of a clause empowering the Council to raise the money required for the purpose of purchasing the said tramways, works, and undertaking.

A long and animated discussion on the subject then followed. Mr. Westcott, a member of the Moderate party, moved the adjournment of the special meeting for a month, so that the legal bearings of the Council's position might be clearly ascertained, but the motion was lost, and Lord Onslow said that after that decision he should not vote for the resolution at all, though when he entered the Council Chamber that afternoon he had determined to do so. Later on in the sitting Mr. Clarke moved that the consideration of the matter should be adjourned for a week, but the motion met with the same fate as its predecessor, after which other members of the Moderate party expressed their intention of not voting for Mr. Hubbard's resolutions. The Chairman put the question, and the majority of the Moderate party left the Council Chamber and passed into the lobbies. The Council then divided, with the following result:—For the motion, 78; against it, 4. The Chairman then explained that, as these numbers, added together, did not represent two-thirds of the Council, the motion could not be carried.

The Unification of London.—The debate was then resumed on the following resolution, moved last week by Mr. Whitmore, M.P.:—

"That Her Majesty's Government be requested to appoint a Commission to inquire and to report what changes should be made in the areas for local administration in the Metropolis, so that the whole County of London shall be divided into districts governed by municipal councils; and that it be an instruction to the Commission in their delimitation of such districts to adhere to existing boundaries and to regard local feeling and historic development so far as may be consistent with considerations of administrative convenience."

When the discussion was adjourned on Tuesday week the following amendment, moved by Lord Tweedmouth, was before the Council:—

"That all words after the words 'requested to' be omitted and that the following words be added:—'introduce in the coming Session of Parliament a Bill providing, on the general lines of the report of the recent Royal Commission, both for the amalgamation of the City and County of London and for the creation of Local Councils, so that the whole County of London shall be divided into districts governed by Councils whose electoral areas shall follow existing boundaries and be determined with regard to local feeling and historic developments so far as may be consistent with considerations of administrative convenience.'"

After some discussion the amendment was agreed to. The amendment was then divided on as a substantive motion, when there voted for it, 65; against, 44.

The Council adjourned soon after seven o'clock.

THE BRIGHTON-ROTTINGDEAN ELECTRIC RAILWAY.

As nearly the whole of the track of this extraordinary railway has been completed, and as the company state that they expect to open it next June, a short description of it will be of general interest. The railway runs from the end of the well-known electric tramway to Rottingdean, a distance of three miles. The rails are laid along the shore just above low-water mark, their distance from the cliff being about 200 yards. There are two pairs of rails, 18 ft. being between the two outermost and 2 ft. 8½ in. between each pair, and the car runs on all four rails at once. At high water the rails will sometimes be submerged 14 ft., so it is evident that the car must be a very odd one. It is a kind of movable platform on four tall legs, the platform, which is 50 ft. long by 22 ft. broad, being at a height of 24 ft. above the rails and 10 ft. above the sea at high water. On it there is a saloon 25 ft. long by 12 ft. broad, on the top of which are seats. The legs are of 12-in. steel tube, and are supported on

bogey trucks which have four wheels each. The whole structure is more like the head of a pier than anything else. It is made to carry 150 passengers and two large motors, so it is calculated that when it is loaded it will weigh nearly sixty tons.

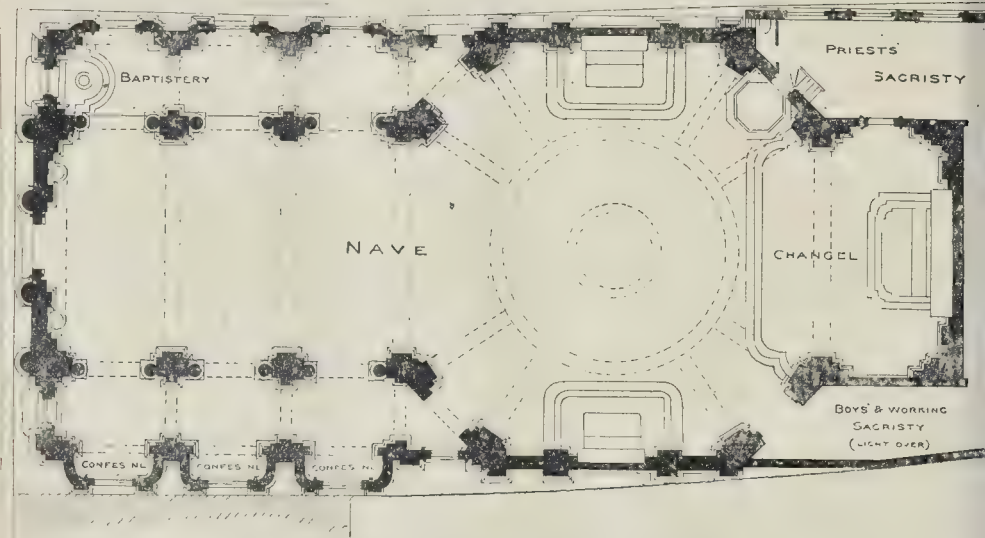
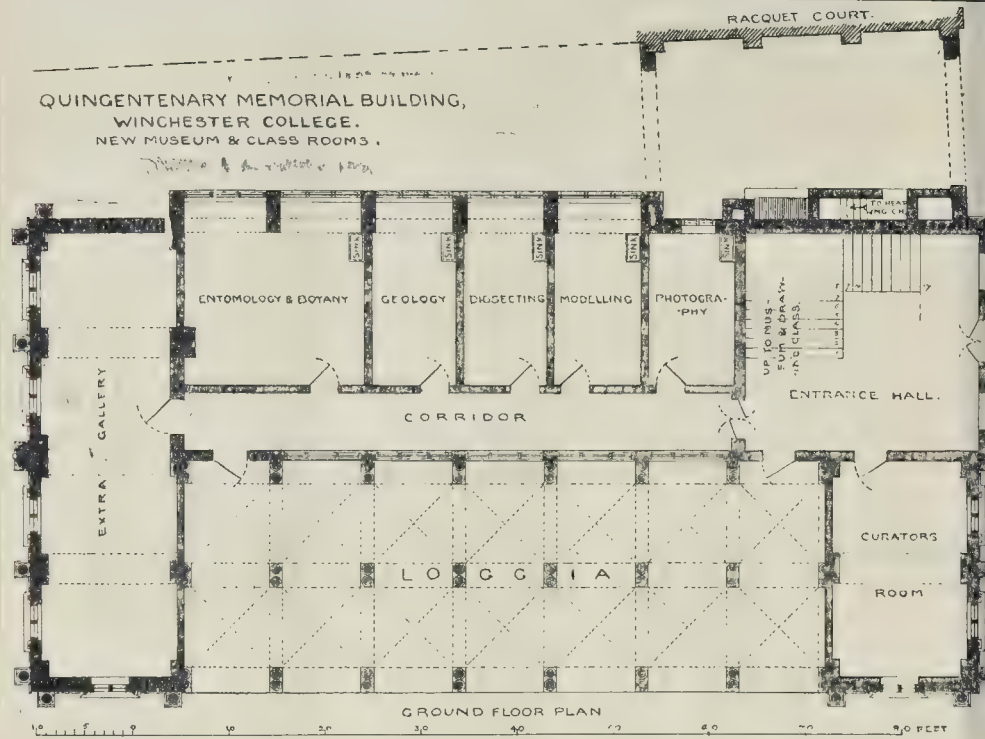
At first, it was the intention of Mr. Magnus Volk, the promoter of the company, to use accumulators to provide the motive power, but he found that the cost was prohibitive. The present plan is to collect the current by means of a trolley from a wire supported by steel posts. It is no easy problem to calculate the amount of power required to drive this pier-head through the water at a speed of six miles an hour—in fact a rough guess is all that is possible. Two 30-h.p. motors are going to be placed on the car, and as the power exerted before the motors have attained their full speed will be much greater than the nominal horse-power, it is thought that this will be sufficient. If no unforeseen difficulties occur it will certainly be an odd sight to see this moving island gliding through the sea with its 150 passengers.

As half-a-mile of the railway is within the jurisdiction of the Brighton Town Council, their consent to the trolley poles has to be obtained. There seems no insuperable objection to them, as the wire will be well above the masts of little sailing-boats, and the posts could each be illuminated by an electric lamp at night. They will not beautify the foreshore, but no one seems to mind this seriously. Mr. Arthur Wright, the electrical engineer to the Corporation, has reported favourably on the scheme, but thinks compressed gas-motors preferable to the trolley. The general opinion however, seems to be against the use of gas-motors, as apart from the refusal of the manufacturers to guarantee such large engines working under these novel conditions it is thought that the vibration produced on the girder-built car would be fatal to the pleasure of the passengers.

We are not surprised that the Town Council are much perplexed over this scheme, but there is something cynical in the proposal of one of the aldermen that the company be required to deposit 1,000*l.* as security, so that in the event of the railway not answering, it could be compelled to clear away all the debris so as to leave no trace of this peculiar railway for visitors to scoff at. It seems a little hard that a company who are doing their best to attract visitors to Brighton should be looked on with such suspicion, and that uncalculated obstacles should be put in their way.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The first meeting of the new session of this Association was held on the 6th inst., at 32, Sackville-street, Piccadilly, Mr. C. H. Compton, Vice-President, in the chair. The Hon. Sec., Mr. Patrick, expressed the great sorrow he felt in making the formal announcement to the meeting of the irreparable loss the Society had sustained by the lamented death of Mr. E. P. Loftus Brock, F.S.A., the Hon. Treasurer. The Chairman and Mr. W. de Gray Birch, F.S.A., also with much feeling made reference to the sad event and spoke of the great services rendered to archæology by the deceased gentleman during the period of nearly thirty years in which he had been connected with the Association. The intimation was received by the meeting with most sincere regret. Proceeding to the business of the evening, the Chairman exhibited a cast of a very interesting and rather unusual seal connected with Rievaulx Abbey and read some notes preparatory to a future paper on the subject. Mrs. Collier brought for exhibition a small collection of bronze tokens, mostly from Warwickshire and Staffordshire. Mr. A. Oliver produced two very elegant Roman lamps of rather unusual design from Corfu. Mr. Patrick, hon. sec., exhibited some Roman fibule of silver and bronze, and some beads, hair-pins, and dice, some of the latter showing distinct evidence of having been plugged, also an elegant little bronze figure of the infant Hercules brought from Italy. Owing to the unfortunate indisposition of the authors of the two papers advertised for the evening they were not completed, and stand postponed. Mr. Patrick then read a short paper upon Winchester House, Southwark, and the recent discoveries of some remains of the buildings, which he illustrated by some old engravings and maps and a plan of the locality. An interesting discussion ensued, in which Mr. R. W. Barrett took part, and afterwards drew the attention of the meeting to the nature of the excavations in progress upon the line of the Roman wall in the North of England, which he had quite recently visited.



Church of the Holy Redeemer, Chelsea: Plan as originally designed.

Illustrations.

PART OF FRIEZE, SHEFFIELD TOWN HALL.

IN the *Builder* for July 13 we gave an illustration of the portion of the sculptured frieze, by Mr. F. W. Pomeroy, which is on the right hand of the principal entrance to the Sheffield Town Hall, and which represented or symbolised various forms of labourers' work. We are now enabled to give an illustration of the other half of the frieze, which has since been completed—the portion

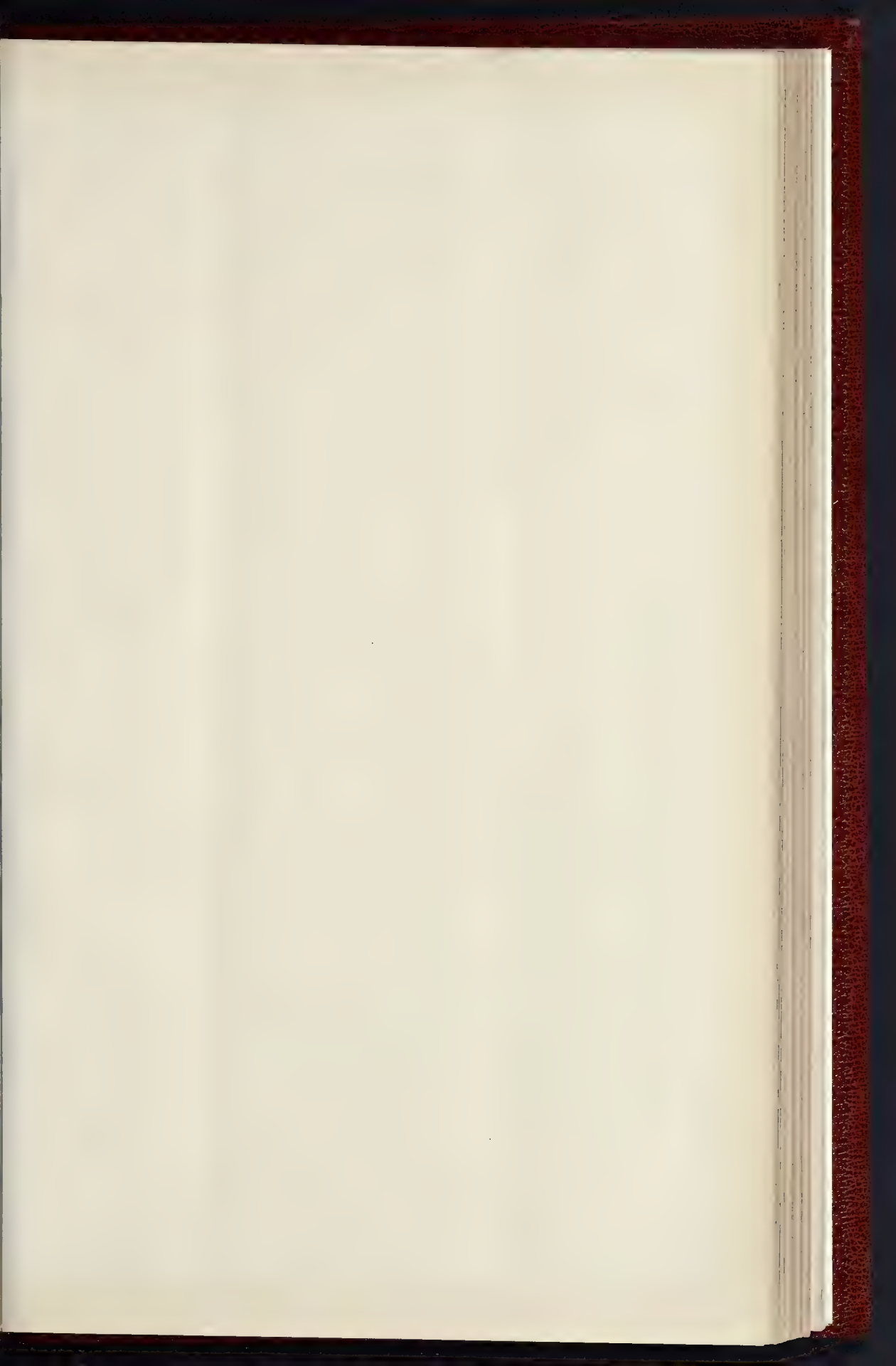
on the left side of the entrance, and which is intended to represent the principal arts and crafts of Sheffield.

A female figure symbolical of Fame leads the way; the three figures immediately following represent Architecture, Sculpture, and Painting; a figure following these and holding a model of the figure of a boy is taken from one made by Alfred Stevens for the Green Lanes Foundry; other figures represent the working of the precious metals. The group of female figures are the electro-platers and buffers; following these are figures carrying ivory tusks, a circular saw, and cases of cutlery; and at the end of the composition is represented the export of the wares for which Sheffield is celebrated.

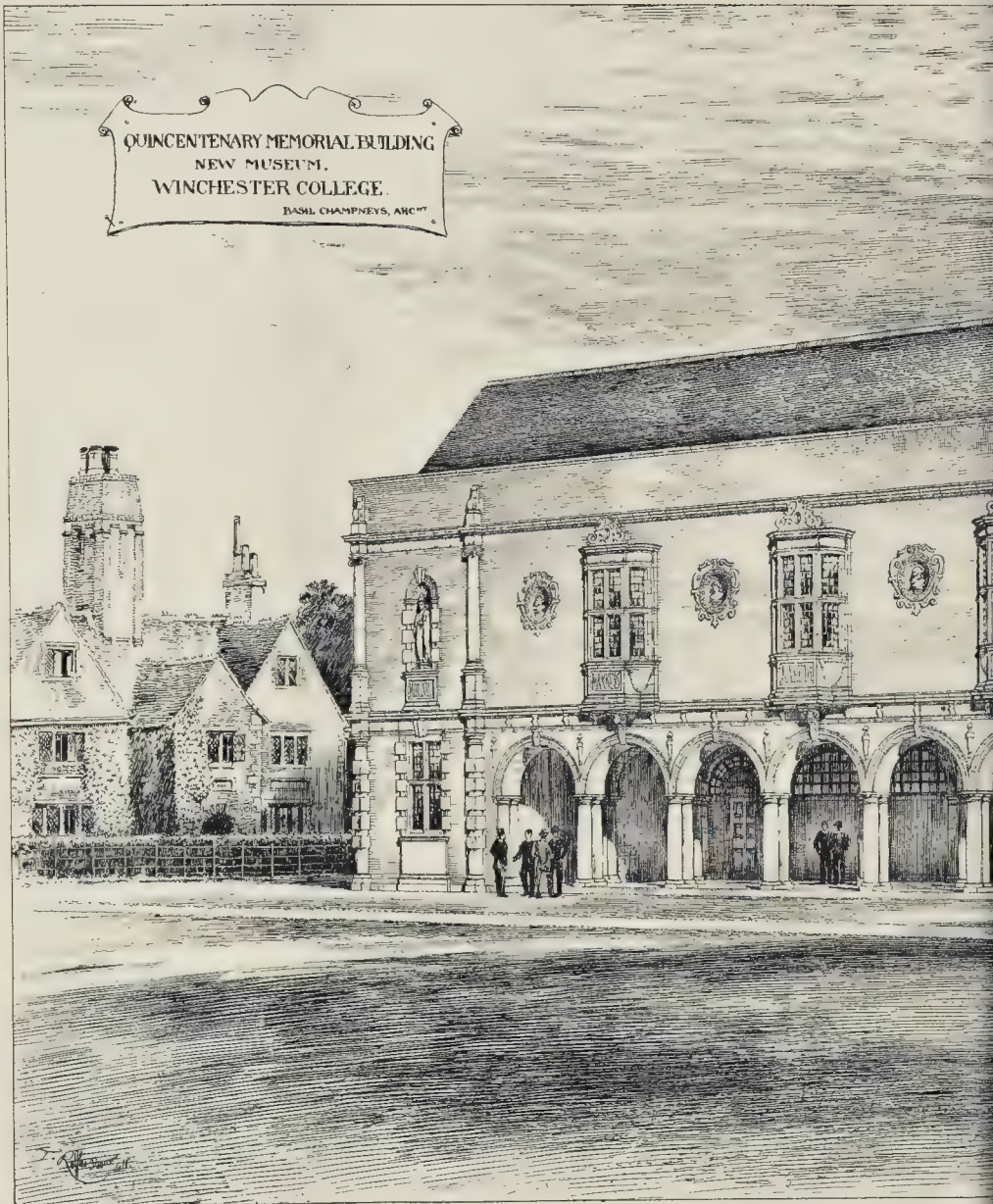
QUINGENTENARY MEMORIAL BUILDINGS, WINCHESTER COLLEGE.

These buildings are being erected, from designs of Mr. Basil Champneys, out of a sum raised by old Wykehamists as a memorial of the "Quingentenary" or five-hundredth anniversary of the foundation of the College. The motto

* "Quin-centenary" would seem to us to be a word, more in accordance with the expressions "centenary, ter-centenary," which are in habitual use.



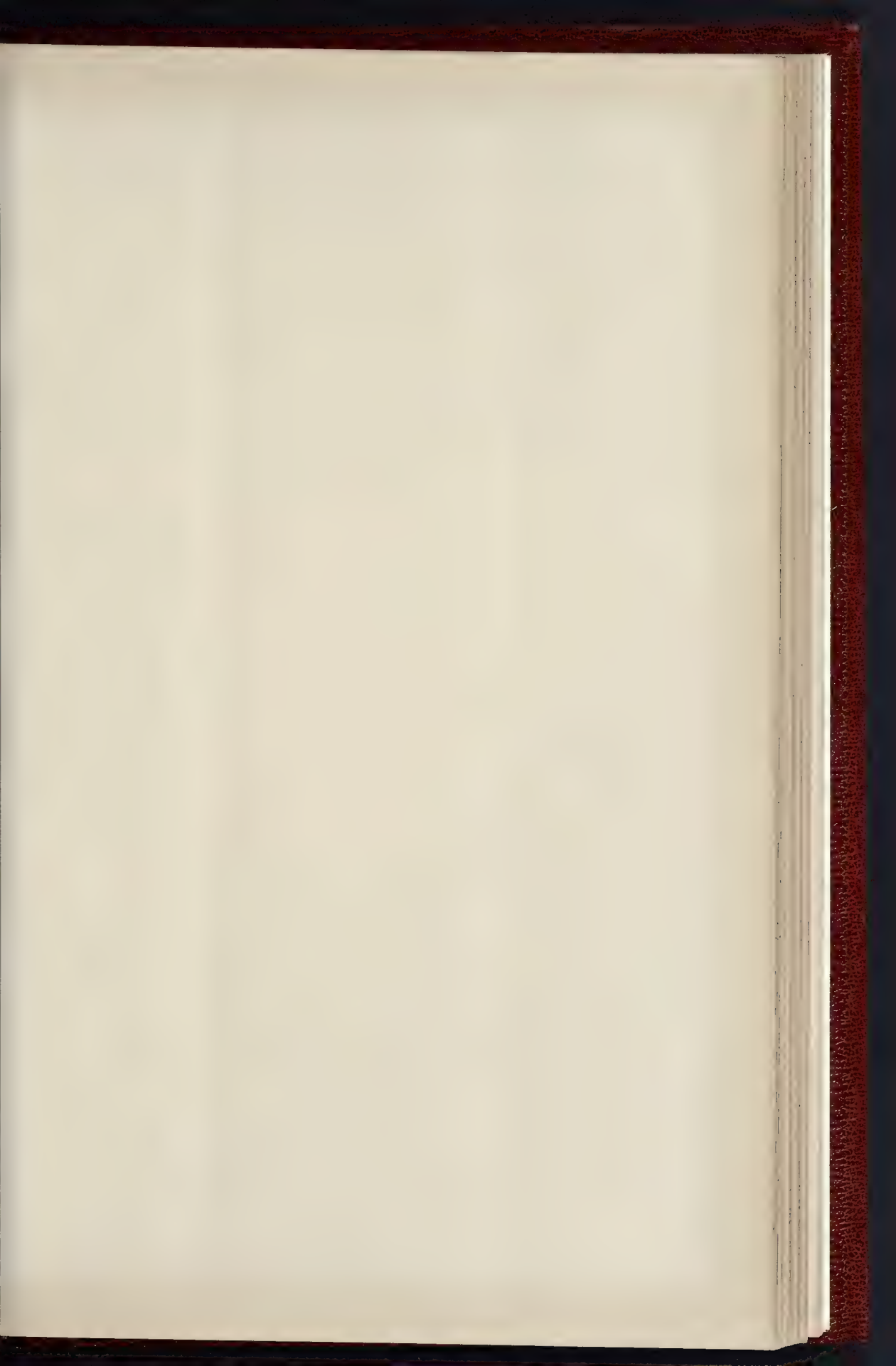
QUINCENTENARY MEMORIAL BUILDING
NEW MUSEUM.
WINCHESTER COLLEGE.
BASIL CHAMPNEYS, ARCHT.



1895.



PHOTO L. THO. SPRAGUE & CO. 118 & 120 EAST MADISON STREET CHICAGO, ILL.

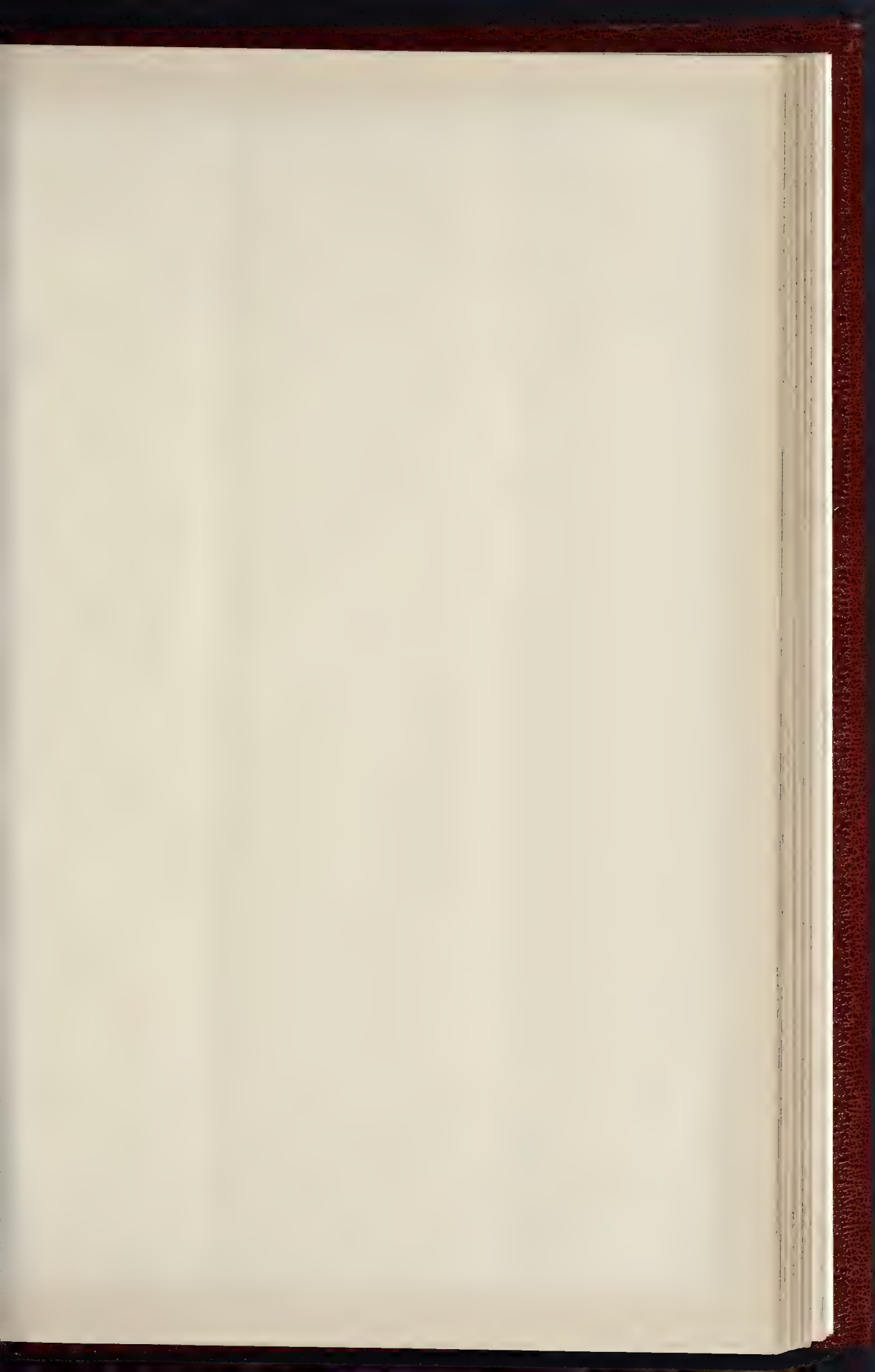




PORTION OF FRIEZE REPRESENTING ARTS AND CRAFTS OF SHIPBUILDING



NEW TOWN HALL, SHEFFIELD -MR F W POMEROY, SCULPTOR

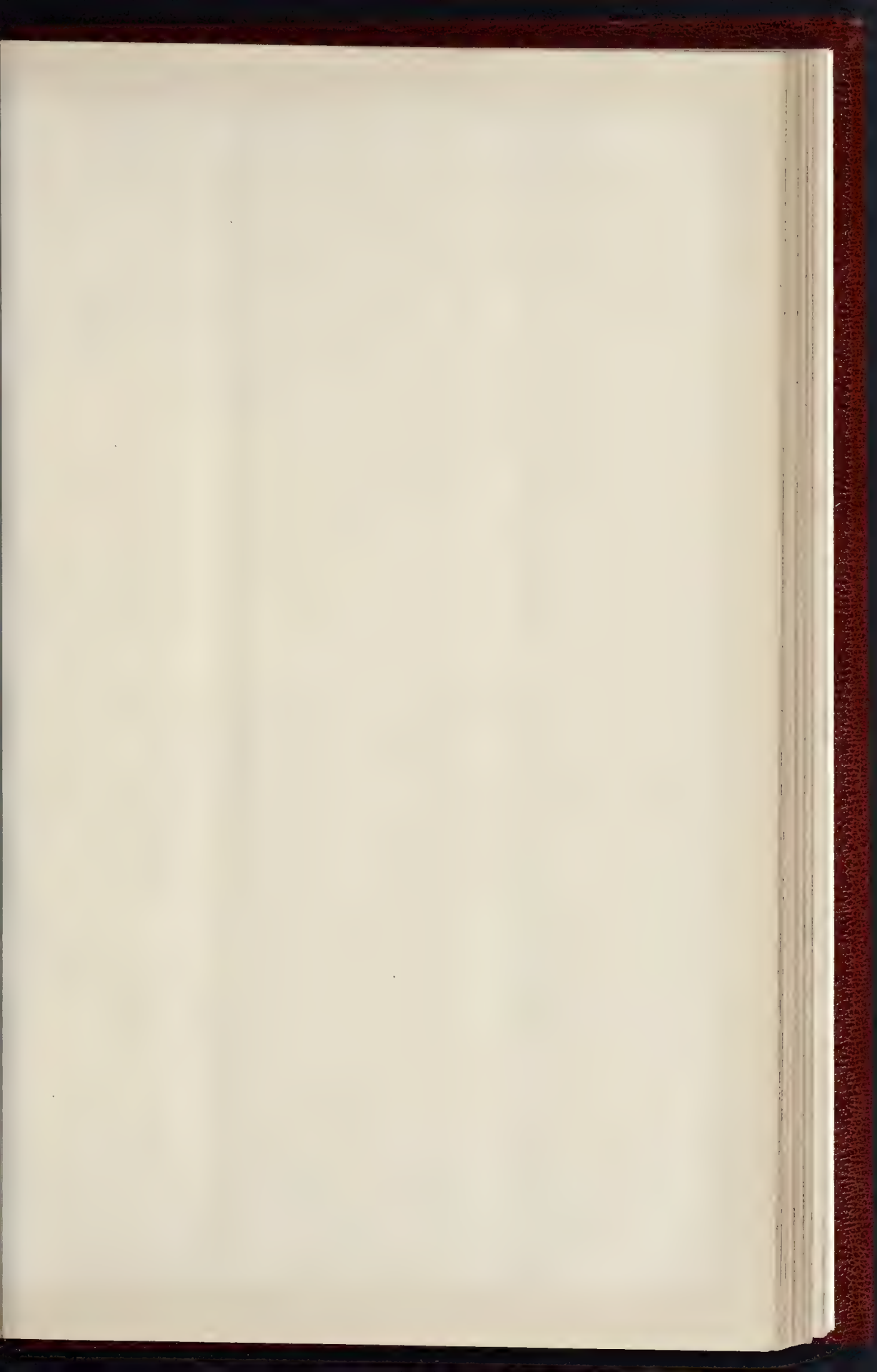


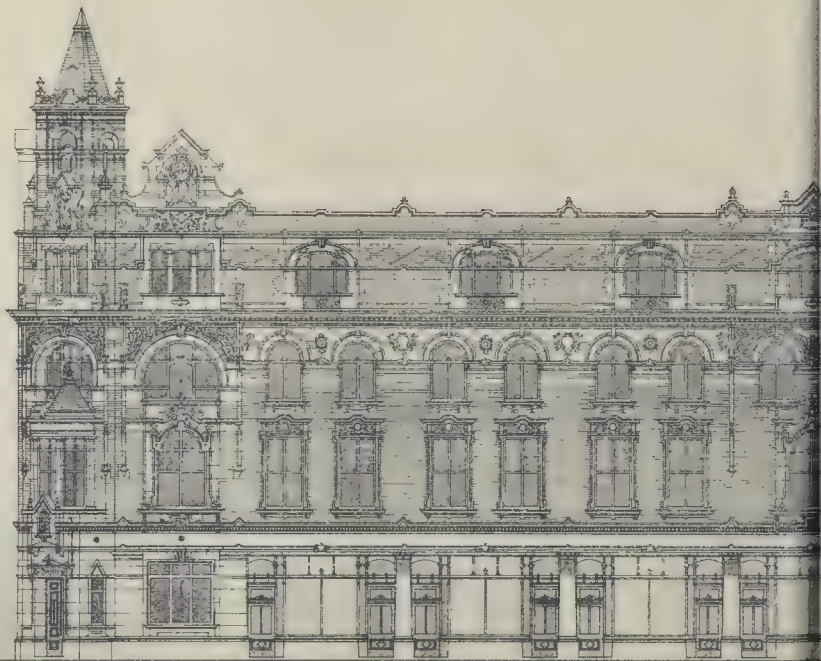
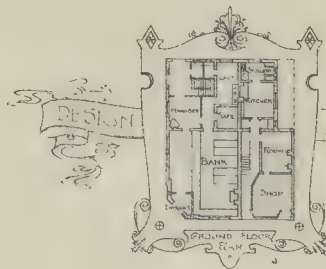


INTERIOR OF CHURCH OF THE MOST HOLY REDEMPTION

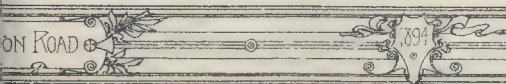
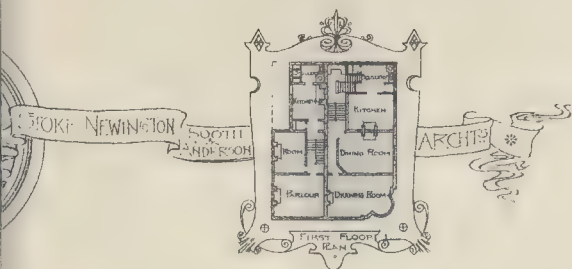


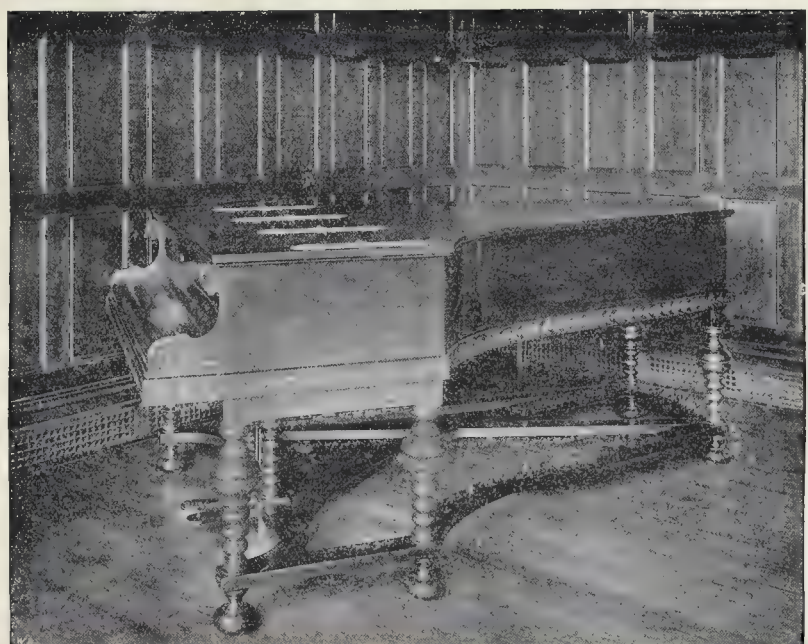
AS ORIGINALLY DESIGNED. MR. B. G. L. ARCHT.





ELEVATION





Piano made by Messrs. Broadwood. Designed by Mr. G. Henschel.

specially made brick, which works six courses the foot, and Ancaster stone. Mr. Kimberley, Banbury, was the builder, and Mr. W. Simpson the clerk of works. The drawing was exhibited at the last Royal Academy Exhibition.

CHURCH OF THE MOST HOLY REDEEMER, CHELSEA.

THE illustration we publish this week is the one promised in our issue of October 10, when we made some further remarks on our article of the week before on "A Question of Church Style." It is to show that Mr. Goldie's first idea for the church was not open to the criticism we made on the actual building as having the appearance of a concert-room or town-hall. This illustration is taken from Mr. Goldie's original design, which was modified, as stated in our issue of the 19th ult., "partly on the question of cost, which led to the abandonment of the same, partly the necessity of contracting the site in accordance with the requirements of the London County Council in regard to the boundaries of the site and the width of the adjoining road." The materials generally would have been the same as in the church now built, which we illustrated on October 12.

DESIGN FOR TERRACE, STOKE NEWINGTON.

THE accompanying design for a terrace of houses was exhibited in the Royal Academy Architectural Room in 1894. Small plans of two stories showing the proposed treatment of one vision of the building are given above the elevation. The architects are Messrs. Booth & Anderson.

BUILDERS' BENEVOLENT INSTITUTION: ANNUAL DINNER.

THE annual dinner of the supporters of the Builders' Benevolent Institution took place on the 14th inst., in the Hall of the Carpenters' Company, London Wall. Mr. John Mowlem Burt, J.P., L. (President), occupied the chair, supported by Mr. E. Smith, the Master of the Carpenters' Company, Mr. J. C. Preston, Clerk to the Company, Major Isaacs, Messrs. T. F. Rider, J. Randall, L. J. Maton, C. B. Trollope, H. Northcroft, G. Bart, C. Bird, T. Hall, C.

Bussell, J. W. Daffield, J. Pearson, T. Stirling, Higgs, J. T. Bolding, Henslow, and other friends of the charity, the company numbering about 160. The usual loyal and patriotic toasts were duly honoured, Major Brutton responding for the "Army and Navy," and Major Charles Bird for the "Auxiliary Forces." The President, in proposing the toast of the evening—"Success to the Builders' Benevolent Institution"—said it was not very often that they, "brother-chips," met round the festive board and enjoyed one another's company as they were doing that evening. They occasionally ran a little counter to one another's wishes, but they could have only one feeling in regard to this charity. It was usual on such occasions to submit a long string of facts and figures. He, however, would not trouble them with these, but would content himself with asking them to open their hearts and purses, and do all that they could for an institution which was doing its level best to provide for those who had seen brighter days, and to aid in bridging over the period between their active life and the time when they would be no more. He believed he had circulated more than 3,000 appeals for the Institution, and if these brought in only a pound a-piece it would largely benefit the charity. He would, however, leave it to the good sense and generosity of his hearers to do the very best they could, and he would couple the toast with the name of Mr. George Plucknett, the hon. treasurer, who had done such good work for the Institution, but whose health, he regretted, would not permit him to be present. The toast was drunk with enthusiasm. Mr. Maton gave "The Worshipful Company of Carpenters." The Company had not only given the use of their magnificent hall, but they were generous supporters of the charity. He believed, too, that none of the City Companies had done more to further the particular trades with which it was connected than the Carpenters' Company. Mr. E. Smith (Master of the Carpenters' Company) replied. He said that the bond of union between carpenters and builders was a close one, and it was most fitting that these banquets should be held in that hall. Mr. T. F. Rider, in an amusing speech, gave the toast of "The President." The toast was well received, and the President briefly replied. The President next gave "The Architects and Surveyors"; adding that not a few of the names in the contribution lists belonged to these bodies. Major Isaacs replied for the architectural profession, and spoke of the friendly feeling that

should always exist between its members and the builders. Mr. C. B. Trollope replied for "the Surveyors." For many years he had had a large practice, and he had the deepest gratitude for the builders, from whom he had received every support. The President proposed the toast of "The Visitors." Mr. White, L.C.C., in replying, said that his sympathies were entirely with the builders, knowing as he did the hardships and difficulties they had to contend with. The ratepayers were paying much more than the value of the large works now being carried out by the London County Council, and he was doing all that he could to alter the conditions imposed upon builders. Mr. C. Preston (Ward-m of the Carpenters' Company), gave "The Vice-Presidents, Committee, and Stewards," to which Mr. Alexander Ritchie and Mr. Lough responded. In the course of the evening, donations were announced amounting to 1,064*l.*, of which the large sum of 897*l.* appeared in the President's list.

MR. HENSCHEL'S NEW PIANO.

THE Pianoforte illustrated above has been made by Messrs. Broadwood for Mr. Henschel, the eminent singer, musician, and conductor, under his directions and after his own sketches. As will be observed, he has given another new suggestion in the treatment of the legs of the piano. The case is a comparatively simple one in regard to decorative treatment; it is in solid oak, merely relieved by a floral ornament incised in a band round the lower margin of the case, and a little carved scroll-work at the extremities of the keyboard. The hinges of the lid are ornamental and of wrought-iron. We very much question the advisability of the introduction of these large metal hinges on the case of a piano. All metal, except that which is necessarily used in the internal construction, is better away. The slightest working loose of these hinges in process of time would lead to jarring.

COMPETITIONS.

SEWERAGE AND WATER SUPPLY, LINSLADE.—The Linslade Parish Council, at a meeting on Friday last week, awarded the first premium for the competitive designs for the sewerage and water supply of the district to Messrs. R. B.

Grantham & Son, Northumberland-avenue, London, and the second premium to Mr. H. B. Nichols, of Birmingham. The rateable value of the district is about 20,000*l.*, and the estimates of cost varied from about 3,200*l.* to 9,900*l.*

COUNTY SCHOOLS FOR GIRLS, BANGOR, NORTH WALES.—We are informed that the designs submitted in this competition by Mr. J. H. Phillips, architect, Cardiff, were placed first by the assessor, Mr. W. D. Caröe, Surveyor to the Charity Commissioners.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of this Society was held at the School of Art on Tuesday evening. The chair was occupied by Mr. Charles Hadfield, the President, and Mr. Paul Waterhouse, of London, read a paper on the "Brotherhood of Architects." In his opening remarks he pointed out that isolation is no more possible to the architect than to human beings generally; but that he is inseparably connected with his fellow craftsmen in the present and the past. Other branches of art, said the lecturer, may rival our antiquity at least in appearance, but none have so completely carried down an identity of tradition from the ancients. This link of union with the past involves a great responsibility, and carries with it the necessity for two attitudes of mind, dignity, and study, each of which is the cause and the result of the other. The best and greatest architects have always humbly followed tradition, however powerful in inventive faculty. The cry for a new style argues in the utterer a complete ignorance alike of the history and principles of architecture, and the theory that because we cannot see progress in our modern work it is non-existent, proves that the theorist knows little of the fundamental natural law that true and wholesome growth is in all departments almost invariably invisible as a process, though measurable as a result. For this reason efforts at invention in art are almost always failures, even when put forth by a Michelangelo. The old Greek doctrine of virtue as a mean has a cogent modern truth. With the men of to-day, architects have a no less vital unity than with those of the past. We influence one another directly by pupillage, indirectly by example, and the latter influence is readily open to abuse. No ideas should be appropriated either from the ancients or the moderns without previous digestion. In fact an attitude of generous criticism, that is of analysis, is the proper highway to intelligent design. We need have no fear because our designs bear a certain similarity to the works of the ancients or moderns if in other respects they are sound. The architects of old had no such fear. The use of traditional form and of proper local method, so far from being a sign of poor invention, may often be the index of a masterly modesty. The reader of the paper concluded with an account of the modern growth of social organisation among architects, and with an appeal for the enthusiastic maintenance of that organisation, and the brotherly unity of which it is the instrument and effect. Speaking of the alliance of the various English societies, which is such a remarkable modern development, he emphasised the constant readiness with which the spirit of that alliance is recognised by the Metropolitan body, the Royal Institute of British Architects. The alliance and the sense of co-operation which it involved was, he said, justly and openly acknowledged as one of the firmest foundations of the Institute. While congratulating the Society on the fact that so many of its members were also members of the central body, he urged upon all present the desirability, the necessity of promoting by every possible means, by personal influence, and by personal enthusiasm, such a spirit of unity and mutual assistance as would most truly make for the ideal Brotherhood of Architects. A very cordial vote of thanks to the lecturer was proposed by Mr. F. Fowler, seconded by Mr. E. M. Gibbs, and supported by Mr. C. J. Innocent, Mr. J. B. Mitchell-Withers, Mr. Thos. Winder, Mr. A. J. Greenwood, and carried unanimously; and in acknowledging it, Mr. Waterhouse said he looked forward to the time when membership of the Royal Institute of British Architects would be looked upon as the nearest approach to a guarantee of fitness to practise as an architect.

THE LAUNDRY EXHIBITION.

THE third annual Laundry, Sanitary, and Engineering Exhibition has been held this week in the Agricultural Hall, Islington, and will close

to-day (Saturday). The exhibition of laundry machinery and accessories required for washing appears to be unusually complete, and the contents embrace every branch of laundry work and a large quantity of machinery. The exhibition appears to be one of the most successful of its kind, and at the time of our visit the whole of the ground floor of the hall was occupied by stalls which were in charge of representatives of the exhibitors, and were not, as is so often the case at similar exhibitions, managed by someone who is responsible for more than one stall, and who knows little or nothing about some of the goods which are on view. But good as the exhibition is, it would have been improved had the promoters excluded those exhibits which have no connexion with laundry or sanitary or engineering work, and had endeavoured to let the space thus gained to the exhibition of more goods that do, for if the word "sanitary" in the title of the exhibition is not employed alone in relation to the laundry, then there are few purely sanitary exhibits, and if it is, then it is unnecessarily used, for all laundry appliances should be sanitary.

There are not many exhibits that we can refer to in our pages, and most of those that we can deal with have already been noticed in our accounts of previous exhibitions. The large and excellent display of sanitary goods at the stall of Messrs. Twyford's, of Hanley, deserves special notice. This firm is exhibiting some very good white enamel hospital sinks, domestic baths, closets, urinals, wash-tubs (in white enamel and yellow-glazed fireclay), and school lavatories. They also show some very massive white enamel urinals, suitable for railway stations, with special provision for flushing, and with an inset of mosaic work at the foot to prevent slipping—a small but a practical feature. The combined lavatory-basin and urinal, with a cast-iron back containing a mirror, is not so good; the ironwork does not seem to combine well with the stoneware, and has a rather meagre appearance. But altogether Messrs. Twyford are to be congratulated upon such a large and fine collection of sanitary goods.

Messrs. Doulton's, of Lambeth, also show some very good white and cream enamel and yellow glazed fire-clay wash-tubs, and pedestals for supporting them, rinsing troughs, slop sinks, &c., as well as their well-known water-softening apparatus, which has been exhibited at previous exhibitions and has already been described in our columns. The enamel wash-tubs are a great improvement, from a sanitary point of view, over the old wooden and zinc tubs which are still largely used; the wooden tubs have joints and corners where dirt or germs may accumulate and the zinc ones are affected by acids. The firm shows two forms of their water-softening machine, one for use where the height of a room is limited and the other where the height is not of importance but where the ground space is limited.

The Blackman Ventilating Company, Limited, have on view a working model of their well-known system of ventilating and rapid drying, which has been previously described by us. Messrs. Seagrave & Bevington (Glover & Hobson, of London), also exhibit a hot-air drying apparatus.

Messrs. Julius Sax & Co., Limited, have a well-arranged stall where they exhibit electric light fittings, &c.

Mr. Sam Deards, of Harlow, shows the "Little Samson" Hot-water Heater, as well as a model of his patent glazing for greenhouses, &c., without putty, paint, springs, lead, or india-rubber.

Among other exhibitors we may mention the Eagle Range Company; J. A. Mawson, Bolton (the new "Coil" rapid water-heating apparatus); Messrs. Caddy (tubular and chilled fire-bars); Messrs. Rhodes & Son, London (gun-metal valves for lavatories, baths, &c.); and Messrs. W. Williamson & Co., High Holborn (the "Pick-up" ventilating fan).

An interesting feature in the exhibition is the model laundry shown by Messrs. Williamson & Co., of Holborn, in which every department of a large laundry is shown.

LLANTHONY PRIORY, WALES.—On page 300 ante we gave some remarks on these remains, in relation to a statement that the nave of the ancient Priory Church had been restored and roofed. The statement appears to have originated in a mistake in a daily newspaper; it struck us as rather a surprising one at the time. What has really been done is the restoration of the small Parish Church of Llanthony, which stands close to the Priory ruins. This was done under the supervision of Mr. Spencer, architect, of Abergavenny, to whom we are indebted for the correction of the mistake.

Correspondence.

To the Editor of THE BUILDER.

THE NEW ARTIFICIAL STONE.

SIR,—Will you kindly extend to me the courtesy of replying to a letter appearing under the above heading in your last issue?

Without commenting on the bad taste and the misleading statements contained in that letter, I beg to say—

1. My patent stone (Patent dated October, 1894) is not the property of the syndicate mentioned.

2. Sufficient time has elapsed for anyone aggrieved by my successful invention to test its validity in the usual manner, without resorting to this cheap method of doing me an injury by making random statements in your columns.

51, Mervan-road, S.W. W. OWEN.

. We give Mr. Owen his reply, of course; but it appears to us, on comparing the description of his stone with that which we gave of the process of the Sandstone Syndicate in our issue of December 2, 1893, that they are very nearly the same thing. The question of the infringement of rights is of course for the patentees to deal with themselves. We have merely, as in other cases, reported on a prospectus and process brought under our notice.—ED.

MODERN BUILDING.

SIR,—Mr. Lethaby's interesting remarks last Saturday naturally "give one pause" and set one thinking as to the why and wherefore of the necessity of these discussions. Perhaps, Sir, Mr. Lethaby, like all enthusiasts, is liable to underestimate the moulding force of the conditions under which we live.

With the general gist of his remarks that the designer and the craftsman should be brought more in touch with one another most agree; but to go further, and to do away with the designer altogether and to make the craftsman such, is a theory which sounds very well perhaps, but is it one which could be made to answer the requirements of the day? Is it not just as reasonable to assert that a general must be as good a marksman as any soldier in his army, or that an admiral like Nelson, with only one arm, and with intermittent attacks of *mal-de-mer*, was no sailor? In other words, is *thought*, as such, to count for nothing? Mr. Lethaby seemed to infer that architecture in the past has been produced without the preparation of drawings—in other words, largely without previous thought.

Although this would appear doubtful, are the cases similar? Is it not necessary to differentiate between the requirements and civilisations of, say, the fourth century B.C. and the thirteenth and nineteenth centuries A.D.? Presuming, in fine, that it would be possible to erect the comparatively simple buildings in the earlier periods without the careful thought necessary to place them on paper, are we to be denied the undoubted good to be obtained from such a process, or to continue to practise in the nineteenth century a custom which may have answered more primitive conditions?

The needs of our complicated civilisation demand such a method to bring itself into line with modern wants. It is no more possible to return to effete manners and customs in building than it is necessary to go about in leather jerkins, booted and spurred, in order to grasp the principles which have produced the glorious art of bygone ages. It should be just as possible to produce a beautiful building under the contract system, properly controlled, as by the slave labour of the Greek period, the military system of the Roman legions, or the feudal servitude of the Middle Ages. The crux of the situation seems rather to lie in the separation of architecture and engineering, a state of things which has no counterpart in the past. Constructive necessities properly met and encountered have been in past ages the greatest stimulus to architectural design and progress, and when this stimulus is taken away from architecture it ceases to have any propelling power.

In short, Sir, the fusion of architecture and engineering, as in past times, would seem to be the only way out of the present condition of things, for it has been concluded, not without reason, that architects are not sufficiently scientific and that engineers are not sufficiently artistic. To produce an architecture expressive of the intellectual and material movement of the age we must certainly seek it no longer by mingling all the styles of the past, but by novel principles of structure.

BANISTER F. FLETCHER.

Junior Athenian Club.

BUILDERS' CLERKS' INSTITUTION OF GREAT BRITAIN.

SIR,—I beg to inform you that the next meeting of the above Institution will be held at the Westminster Town Hall, Cannon-street, Westminster, S.W., in room No. 13, on Saturday, November 23, at 6 p.m.

It is hoped by the committee that all those

aged on the staff in builders' offices will attend, bringing with them their fellow clerks engaged in trade.

Prospectuses can be obtained on application to the undersigned. J. PEARSE BOWDITCH, 17, Duteberg-road, Secretary, pro tem. Brixton, S.W.

The Student's Column.

METALS USED IN BUILDING.

XIX. AND XX.

TIN ALLOYS (continued).

TIN AND ANTIMONY.—This alloy may be produced either by fusing the two metals together, or by reducing sulphide antimony in contact with tin. The substance known as Britannia metal is composed of (1) alloys of tin hardened by antimony, (2) an alloy of tin and antimony in the proportion of 20 to 20 per cent. of the latter, or (3) the alloy, with a small amount of copper added. A common variety is composed of 350 lbs. best old-tin, which is melted and raised to a dull heat, when 8 lbs. of melted copper are added, the whole being thoroughly stirred to promote rough incorporation, then 28 lbs. antimony, 18 lbs. brass in a molten state are introduced. The brittleness of such alloys is, naturally, increased with the proportion of antimony. Expansion takes place as the alloys are cooled. An extreme limit for tin-antimony alloys reached with a metal made of 67 per cent. tin, 33 per cent. antimony. A ductile substance is produced in parts tin to 1 of antimony. The addition of zinc and is very objectionable in Britannia metal, though often found; they materially increase the hardness and brittleness of the alloy; it is generally admitted that if much zinc is employed (as in the manufacture of cheap material) antimony must be proportionately lessened, and is not bad from the metallurgical standpoint, it seriously impairs the lustre of the compound, the latter being required for ornamental purposes. **Tin, Copper, and Zinc.**—This alloy has been extensively investigated in the United States, we particularly by Professor Thurston, who held that the alloys of maximum strength are made about a point not far from copper 55, 43, tin 2, as shown upon a triangular model which the different degrees of strength are divided by different degrees of relief or elevation by a common base. An alloy of this composition, if fairly good metals are employed, the proportions are accurately made, well heated, perfectly fluxed, and so poured as to produce a sound and pure metallic substance, such prompt cooling as shall prevent oxidation, is the strongest variety of this useful metal that can be made.

Tin, Lead, and Zinc.—The addition of lead in zinc alloys imparts more resistance to the metal. The following table is from one drawn by M. Guettier*—

	Tin.	Zinc.	Lead.
1	76	12	12
2	12	76	12
3	12	12	76
4	34	33	33
5	10	45	45
6	45	45	10
7	45	10	45

Nos. 2 and 3 are both adapted for castings, and better for that purpose than either of the is considered separately. Nos. 2, 4, and 5 possess more resistance than pure zinc, whilst 1, 3, and 7 are specially intended to withstand friction. No. 6, however, is the most useful for our purposes, the others being too soft and brittle; that is excellent for small castings for ornamental and decorative work. They all possess great disadvantage of becoming rapidly oxidized under atmospheric influences, a circumstance, however, that does not seem to prevent its extensive use when made up in imitation of the class metals.

Lead and Iron.—Tin even in small proportions is injurious to iron. Karsten found that 1 cent. of tin added to iron made the latter brittle when cold, but not when hot, the iron could be forged though it gave out vapour which condensed on the anvil. Mr. Billings ascertained that an almost insignificant quantity of tin, in the absence of metals, renders iron cold-short, and has a harmful effect.

Tin-plate.

In the last article we briefly alluded to the

Guide Pratique des Allages," 1865.
Trans. American Inst. Mining Engineers," Vol. v.,

plate alloy, which, being much cheaper than pure tin, is often substituted for it in coating iron. In view of the great importance of the tin-plate industry in England (from whence it is exported in great quantities), and its applicability for certain building purposes, though not of a very high order, we may give the following details.

The first record of the manufacture of tinned-iron plates refers to Bohemia, where they were made prior to the year 1620. Subsequently, the art found its way into Saxony, from which country it was introduced into England in 1670, though the industry was of very insignificant proportions until its firm establishment here in 1720. It developed chiefly in Monmouthshire, and the chief centres of production at the present time are in that county, South Wales, Staffordshire, and Worcestershire. It has been estimated that the tin-plate industry of Great Britain consumes annually nearly 500,000 tons of pig-iron, 1,000,000 tons of coal, and about 10,000 tons of tin, besides large quantities of sulphuric acid, lead, &c. Until within the past few years charcoal or coke of iron bars were considered to be the only kind of iron suitable for making the plates, but now place to a large extent. Many tin-plate manufacturers have erected their own steelmaking plant. The tin is distributed evenly over the sheet, and can be applied thinner than formerly by rolling processes. Another process which has been in existence about twelve years, consists in operating by mechanical means upon the sheets of metal emerging from the bath in which they are coated, which tends to give a better finish than would otherwise be obtained. This is accomplished by causing the sheets as they come out of the bath to be guided by rollers covered with molten grease so as to avoid exposure to the air, between washing rollers kept covered with molten metal. The washing rollers do not bear on the sheet, but are so closely adjusted as to wash off the scum and refuse on its surface. On leaving the rollers the plate, still passing through a bath of grease to prevent exposure, is sent through finishing-rollers to remove the excess of metal, and finally through a pair of improving-rollers, which bear against each other by means of springs, and thus lightly nipping the sheet between them impart a smooth surface and finish to the metallic-covered sheet.

It is widely believed that the tin imported into this country from the Malay Peninsula and Australia is more suitable for tin-plate work than that raised in Cornwall. It is stated that the latter is not so fluid, nor so soft, and will not cover so large a surface of plate as the imported tin. We imagine, however, that a great deal depends on the particular variety of Cornish tin and the relative purity, or ultimate composition when smelted.

LEAD ALLOYS.

Some of these have been treated under other headings when the proportion of lead was subordinated to the other metal, or metals, in the alloy, or when dealing generically with a particular type of alloy of which lead was only an accessory constituent.

Lead and Antimony.—The prime object of adding antimony to lead is to harden it, though if too much be mixed the result is a hard, brittle, and crystalline mass of metal. A good alloy is lead with one-third or one-fourth of its weight of antimony; another, two parts lead, one of tin, and one of antimony; a third, fifteen parts lead to one of tin, and four of antimony.

Lead and Copper.—To effect a perfect union between these two metals they must be used in definite proportions. Mr. Hiorns remarks that when lead is in excess the metal largely separates from the copper, or becomes much oxidised if the temperature be too high; so that these alloys are made best when a large percentage of copper is present. Lead is frequently added to certain copper alloys, such, for instance, as brass required for turning, as it renders them more fusible and more easily worked with cutting and abrading tools.

Lead and arsenic form a hard and brittle alloy, used in shot manufacture; lead and iron alloyed are not of much use in the arts, though the want of affinity between the two is sometimes taken advantage of in metallurgical operations, in separating iron from other metals; lead and bismuth unite by simple fusion. But none of these mixtures are important as metals used in building.

The Uses of Lead and Lead-composition.—It

* See "Mineral Resources U.S. for 1883-84," p. 636.

will be convenient at this stage to give a brief account of the uses of lead and its compositions in the building industry. One of the foremost that will occur to the student is its employment for lead pipes. A large proportion of the lead used in pipes so-called is extensively alloyed with other metals, but the result of the union from the manufacturing point of view should not materially affect the softness and plasticity of the whole. Thus we frequently find small quantities of zinc and tin employed; and the "lead pipes" turned out from some works are made of metal of a leaden hue only—the cheap composition being extremely complicated. Confining our attention, however, to lead pipes in which the metal is fairly pure, it may be remarked that these have been much used and are (to a greater extent than is generally believed) still employed for water service. The action of hard water, that is water containing large quantities of carbonate of lime or magnesia, or both, on lead pipes is practically nil; but the effect of soft water on the pipes often leads to lead-poisoning. If soft water remains in contact with the lead for any length of time, the oxygen held by the water tends to convert a portion of the lead into oxide of lead, which is dissolved by the water. This action is promoted most vigorously on bright, recently-cut surfaces of the pipes, as when first put in, or after repair. If the pipes were coated internally by other mineral matter deposited by the water, the deleterious action alluded to would be reduced to practically unimportant dimensions. But this is frequently not the case, hence the recurrence of lead-poisoning in towns where very soft water is supplied. It should be remembered that even if a very minute portion of the oxide of lead is dissolved in this manner from pipes per diem, the lead tends to accumulate in the system, and repeated doses of it may give rise, in course of time to excruciating pains internally, if death does not result. This fact has been known for many years, and remedies have, after a fashion, been adopted. In such localities the use of lead pipes for the conveyance of water, or for cisterns, has either been done away with, or the pipes have been coated internally with tin or some similar metal or composition. Except that their plastic properties are often much modified the use of lead compo-pipes are, therefore, much to be preferred as tending to diminish the indirect action of the water. For our own part, however, we should like to see pipes in which lead enters materially into the composition, abolished altogether for water-supply purposes, and some of the many other harmless metallic pipes on the market substituted therefor.

But little need be said concerning lead employed for roofing purposes. In general its great weight (specific gravity, 11.4) is against it for ordinary roofs, even if prices were not prohibitive; whilst its low melting-point renders it extremely dangerous in conflagrations. Lead sheets used for roofing frequently buckle, in a similar manner, to the lead linings of domestic scullery troughs; this is doubtless due to continued expansion and contraction consequent on alternations of temperature of the air in the one case, and the intermittent action of hot and cold water in the other.

The use of lead as a glass-making material is an English invention of the seventeenth century, and grew out of the use of mineral fuel in glass-manufactories in place of wood. This fuel required pots to protect the glass from impurities found in the coal, and this shield so reduced the temperature that reached the glass making silica, &c., within it as to demand a better flux; and lead, which is a powerful flux in this connexion promoted fusion at a lower temperature. The result was the production of a fine quality glass. Glass made with lead is more dense, has a greater power of refraction, and is less liable to breakage from sudden changes of temperature than either soda, potash, or lime glasses. It is soft and easily worked, but is of surpassing brilliancy and transparency.

Lead as a glazing material has, for centuries, been employed for stained-glass windows.

White lead forms the base of many mineral paints, and red lead, already described, is put to many uses by the engineer and the gasfitter—especially in the suburbs—but it may be charitable not to describe these in detail.

ALUMINIUM ALLOYS.

We have already dealt at some length with aluminium itself—incidentally, also, we have touched upon a few of its alloys in illustration of the general applicability of the metal to build-

ing purposes. The student is requested to read that in connexion with the brief remarks which follow.

The union of aluminium with copper forms two distinct series of alloys, one of which is represented by aluminium bronze containing only from 5 to 12 per cent. of aluminium, the other is typified by copper-hardened aluminium with from 3 to 15 per cent. of copper. The aluminium bronzes have been referred to under copper alloys, and it will be remembered that they are very dense, fine-grained, strong and fairly ductile. The melting-point of bronze with 10 per cent. aluminium is about 1,700 deg. Fah.; a peculiarity of this alloy is that it is malleable at a red heat, rendering it more convenient to fashion it for divers purposes than other bronzes—none of the strong bronzes being malleable at a high temperature. A small percentage of aluminium added to the ordinary tin-antimony-copper Babbitt metal increases the utility of that alloy for the hardest classes of machinery-bearings. Aluminium is regularly used in the United States in the manufacture of steel, the purpose of the addition being mainly to prevent the retention of the occluded gases in the steel, and thereby to yield more solid ingots. It appears, also, to give extra fluidity to the metal.

The addition of a small proportion of aluminium to ferro-manganese renders the combined carbon in the manganese alloy graphitic, and throws the carbon thus separated in a graphitic state out of the molten mass, useful in the production of low carbon steel. Added to cast iron it causes the iron to be softer, freer from shrinkage, and lessens its tendency to "chill." An alloy of 20 parts nickel and 8 of aluminium, and a peculiar one—a species of bronze—composed of 60 parts (or 40) cobalt, 10 parts aluminium, and 40 parts (or 30) of copper are comparatively recent inventions, stated to be of much value for minor metallic decorative purposes.

The alloy known as aluminium-Bourbonnais is of considerable importance in France; its composition is aluminium, 85.74 per cent.; tin, 12.94, and silicon, 1.32. The special advantage of this is its capability to be cast in very solid shapes, the metal having very little shrinkage in castings. Small quantities of aluminium added to zinc renders fairly pure zinc much more efficient in galvanising, yielding a thinner, more tenacious, and finer-looking casting. Conversely, if up to 25 per cent. zinc is mixed with aluminium, the resulting metal is found to be much harder and stronger than pure aluminium in castings.

Perhaps the most unsatisfactory property of aluminium is the difficulty with which it is soldered. During the past two or three years great improvements have been effected in that direction, especially by the employment of phosphor tin solder, and one composed of 80 parts tin, 20 parts zinc, using a flux composed of 80 parts stearic acid, 10 parts chloride of zinc, and 10 parts chloride of tin. Tin of a high degree of purity has also been used as a solder; but the solders most commonly adopted may be summarised as follows:—

Alloys for Soldering Aluminium.

Alloys.	Grains.	Fusing Point, Centigrade Degrees.
Tin	1,000	280—300.
Lead	50	
Tin	1,000	280—300.
Zinc	50	
Tin	1,000	350—400.
Copper	10—15	
Tin	1,000	350—400.
Nickel	10—15	
Tin	900	
Copper	100	
Bismuth	2—3	

The last-mentioned solder is especially suitable for aluminium bronze. Chloride of silver as a flux in soldering has found much favour in recent years. It may be added that ordinary copper soldering bits discolour the aluminium, and bits of pure nickel which have been found to answer the purpose very well, are now almost exclusively employed. The great facility with which aluminium may be welded electrically is a property often used in substitution for soldering.

ALLOYS OF QUICKSILVER.

One of the most remarkable properties of mercury is its power of uniting with other metals at the ordinary temperature to form combinations termed amalgams; iron and platinum are practically the only metals in common use that will not yield to it. Some amalgams are solid, whilst others are fluid; the former are often of a crystalline nature, the latter may be regarded

(doubtfully) as the solid amalgam dissolved in an excess of mercury. The bond of union in any case is of the slightest; in the majority of instances a fair proportion of the mercury can be divorced from the amalgam by pressure. A liquid amalgam may, after being made some time, become partly solid by reason of a portion of the mercury chemically uniting—or, at least, uniting in definite proportions—with the metal "dissolved," and crystallising out in the fluid, leaving the excess of mercury behind. That portion which has assumed the crystalline condition is the real amalgam.

We have stated that iron and platinum will not amalgamate with mercury, i.e., under ordinary conditions; but they may be made to do so with great difficulty, and the same can be said of cobalt, nickel, and manganese. Gold is easily penetrated by mercury; as a matter of general interest it may be noted, for instance, that if the surface of a gold ring is allowed to remain in contact with mercury for a short time the precious metal is rendered so brittle as to become useless.

Tin-Amalgam.—This forms an interesting and useful alloy, though not so extensively employed as formerly. A mixture of 1 part tin to 10 of mercury becomes liquid, but if the two metals be united in equal proportions the result is a solid alloy. If molten tin and mercury are brought together in the proportion of 3 parts of the latter to 1 of the former, the amalgam is obtained in cubic crystals. Tin amalgam has been largely used for silvering the backs of looking-glasses. The silvering of mirrors with plane surfaces consisted in applying a layer of tin-foil alloyed with mercury to the back of the glass. The workshop for executing the process is provided with several smooth tables of fine-grained freestone or marble, truly levelled, having round their contour a rising ledge, within which is a gutter or groove. These tables rest on an axis, so that they may be inclined at any desired angle. A sheet of tin-foil, a little longer than the glass to be covered, is carefully spread on the surface of a table, and over this a small quantity of mercury is spread, which penetrates and dissolves the foil. A greater quantity of mercury is now added, and the surface of the glass to be "silvered" is applied. The excess of mercury is run off from beneath by decanting the table, and after removal to another table the plate is, in course of time, made to assume a vertical position, when the amalgam has become fairly dry. About a month is required for the draining and finishing processes, though smaller glass objects only take from a fortnight to three weeks. The amalgam finally adhering to the glass contains about 1 part mercury to 4 of tin. The method of "silvering" concave and convex mirrors are modifications of this. Mirrors may also be made by precipitating silver on the glass. Small iron castings may be tinned by an amalgam process.

Lead-Amalgam.—The union of lead with mercury may be effected either by pounding lead filings with the fluid metal, or by mixing the lead with it in a molten state. A small percentage of lead improves mercury used for meteorological purposes.

Zinc-Amalgam.—Very brittle alloys are made by this union; 3 parts zinc to 1 of mercury being extremely brittle. Five parts mercury with 2 of zinc and 1 of tin forms a metal occasionally used for the rubbers of electric machines.

Gold-Amalgam.—The old method of fire-gilding was essentially based on the amalgamation of gold and mercury, the proportions being in accordance with the class of substance to be gilded. The amalgam may be prepared as follows:—The gold is placed in a crucible, and when turned slightly red the requisite quantity of mercury is added—a common mixture being 8 parts of mercury to 1 of gold, and the crucible is left on the fire until all the gold is dissolved. The amalgam of gold is applied to brass through the medium of pure nitric acid holding a little mercury in solution; 100 parts of mercury and 110 by weight of pure nitric acid are placed into a glass matrass. On the application of a gentle heat the mercury dissolves, with the disengagement of fumes of nitrous gas which are permitted to escape. This solution is diluted with about 25 times its weight of pure water and is ready for use. The gilder's brush is dipped into it and is drawn over a lump of the gold amalgam described, which is then applied to the surface of the brass. This process is repeated again and again, the surface is washed, and finally the work is put to the fire to volatilise the mercury. In gilding polished iron and steel, auriferous ether, prepared by a nearly neutral

solution of gold in muriatic acid mixed with "sulphuric ether," is applied to brightly-polished steel or iron, when the ether flies off and the gold adheres; but this class of gilding is neither rich nor durable. Of course, the method of cold gilding is very different, an amalgam not being employed.

Silver-Amalgam.—This may be made by mixing finely-divided silver with mercury; a common process is to precipitate silver from solution by copper, when the precious metal obtained in a fine powdery condition, which is then mixed with mercury. Or, if 6 parts of a saturated solution of nitrate of silver with 2 parts of a saturated solution of mercury nitrate are mixed with an amalgam of silver and mercury, the proportion of 1 part of the former to 7 of the latter, arborescent crystals of the amalgam are obtained. When the union is assisted by the aid of an electric battery amalgams very rich in silver are derived.

Many other amalgams may be obtained, such as union of mercury with bismuth, or cadmium, copper, magnesium, potassium, and sodium, but they are more useful as assisting metallurgical operations than as metals used in building or decoration.

In concluding this part relating to metallic alloys, it may be stated that no space has been devoted to many of the principal alloys of metal mentioned, for the simple reason they do not fall within our province. The student must not imagine, therefore, that the foregoing are in any sense representative of alloys as a whole as used in all industries. Thus we have said nothing concerning the valuable mixed metals produced with gold and silver as bases, except in so far as those substances may be of interest either historically, or as used at present in gilding and silvering. The same may be said with reference to alloys of platinum; whilst those of iron have only been dealt with in a general way for reasons explained in the first article of this series.

OBITUARY.

MR. J. W. TROUSNOR.—We regret to announce the death of Mr. J. W. Trounsor, F.R.I.B.A., which occurred suddenly at his residence in Clarence street, Penzance, on the 8th inst. Mr. Trounsor was the son of Mr. John Trounsor, builder, Penzance, had an extensive practice as an architect throughout West Cornwall, and had carried out some large works, including the mansion of Boscawen at St. Buryan, the addition to St. Peter's, Newlyn, the jubilee memorial extension of St. Paul's, Penzance, the new Wesleyan Chapel at Penryn, P. Hill Wesley School, Falmouth, the Bible Christian Schools, Heamoor, various board schools in Cornwall, Messrs. Chudleigh's premises at Johannesburg, and the recently-opened extension of the Penzance Wesleyan Day Schools. Mr. Trounsor, who was forty-six years of age, leaves a widow and three children.

GENERAL BUILDING NEWS.

COUNTY COUNCIL BUILDINGS, STAFFORD.—THE new County Council buildings have just been opened at Stafford. The buildings have been constructed from the designs of Mr. H. T. Hare, of London, superintended by his clerk of works, Mr. James T. Bow, E. The contractor was Mr. H. Lovatt, Wolverhampton, and the building has been superintended by Mr. Wilson Lovatt, assisted by Mr. J. M. Tildesley. The carving in wood and stone has been executed by Mr. W. Ammoner, of London. The modelling and plaster enrichments are by Mr. F. E. Schenck, also of London; leaded lights by Messrs. Pearce; lifts by Waygood; ironwork construction and fireproof flooring by Messrs. Lindsay & Co., Westminster; and the entrance-gates and ironwork by Messrs. Starkie Gardner & Co., of London. The lavatories throughout have been fitted by Messrs. Shanks & Co., of London and Glasgow. The building was illustrated and described at some length in our issue for August 6, 1892.

ALL SAINTS CHURCH, NORFOLK-SQUARE, W.—This church, which was destroyed by fire rather more than a year ago, was re-consecrated on the 1st inst. The old church was built of brick with Kentish rag facings, and had galleries. The fabric of the walls was fairly unimpaired, but the whole of the roof and the stone-work was destroyed. The old walls were in part retained, being coated externally with red brick. Entirely new arcades have been built, considerably further apart than the old, and the material for this and other dressings is terraced cotta. The roof is of Oregon pine and deal. The thrust of the wide trusses is taken by concrete piers stretching across the aisles and on to new buttresses the tops of which cover the concrete and serve as ventilation exits to flues left in the buttresses to ventilate the extensive basement. The slates are laid in concrete plaster, in the manner introduced by the architect. The passages and chancel are floored with mosaic by Messrs. Turpin. The stalls and seats to nave, which are of some

* Consult "Mineral Resources of the United States for 1892," pp. 256 et seq.

roban design, are of padouk, a hard and red wood from Burmah, and have been executed by Messrs. Norman & Burt, of Burgess Hill. The brass work is by Messrs. Thomason, of Birmingham. The font, which is not yet finished, is of Jacobean design. The electric lighting has been carried out by Messrs. Sothey to the architect's signs, and is effected by suspending from the roofs number of single lights with glass shades. An organ has been erected by Messrs. Hill, the whole of a great organ being built into the chancel. The principal feature of the outside is a terra-cotta porch at the west end with five gables covering three porways and two recesses. The terra-cotta is by the Tamar and Coalville Company. The proposed r-tower belfry-stage and spire has still to be tried out, as well as a carved oak canopy over the ar. At the east end of south aisle a morning chapel has been arranged on the site of the old lly chapel. The contractors are Messrs. Perry & Co., of Bow, and the architect Mr. Ralph Nevill, S.A., of London.

MARKET, SWANSEA.—The foundation-stone of new Swansea Market has just been laid. The architects for the work are Messrs. J. Buckley & Glendinning Moxham. The plans for a new market were selected in open competition. The site is about 2½ acres, and the frontage to Oxford-street being 416 ft. This will be built of red Ruabon bricks with Bath stone dressings. The principal entrance will be opposite Portland-street, with towers on each side rising to a height of 60 ft. There are two minor entrances in Portland-street and one in Union-street. There are eight bays, each bay is about 20 ft. wide. The construction will be chiefly of iron, the top portion glazed with patent bars. The floor will be paved with patent granolithic paving. The main roadway from Portland-street to Orange-street will be paved with native stone setts. The contractors are Messrs. Bennett Bros., Swansea.

ST. PATRICK'S CHURCH, BIRMINGHAM.—The new Catholic Church of St. Patrick in Dudley-road, Birmingham, was formally opened on the 29th ult. The west front consists of a deeply-recessed entrance with a gable over, surmounted by a niche containing a statue of St. Patrick, between two large two-light windows. On the south side is a small tower containing the bell, and the main entrance is Gothic, with a baptistry treated with an apsidal end, in which is an alabaster font. The nave is divided into five bays. To the north of the chancel is the Lady Chapel, and on the other side of St. Joseph, with archways between the chancel and chapels. There are three confessionals, one on the north and two on the south side, also a vestry for the use of the priests and choir. The nave is of timber (pitch-pine), and the aisle roofs are carried on internal flying buttresses in place of principals. In the centre is a ventilating turret, with openings into a large flue communicating with the materials used are red bricks with red stone dressings, the roof is of red tile, and internally red stone chandeliers and columns, with Gothic style. The church is French Gothic of the twelfth century. The cost has been about 5,000l., and the role of the work has been carried out from the signs and under the superintendence of the architects, Messrs. Dempster & Heaton, of Birmingham. Mr. John Bowen, contractor, of Birmingham. The building is of red brick, with Bath stone dressings, and the building is carried out by Messrs. Hardman, Powell & Co. The heating, which is by radiators, is by Mr. Henry Hope; the other wrought-iron work by Messrs. T. & A. Barratt & Co. and Messrs. Thomas Tawn & Co.

RESTORATION OF CLUNGUNFORD PARISH CHURCH, SALOP.—The re-opening of Clungunford Parish Church after restoration has recently taken place. Until its restoration the fabric consisted of an unusually large chancel, an aisle, and a transept, with an oak roof, on the north side. It had a small bell-cot, containing three bells, which date from about the reign of Edward I., each having Latin inscription, and severally dedicated to St. Michael, St. Gabriel, and St. Andrew. Since the restoration began a stone tower has been built on the north side containing the heating apparatus, a choir vestry, and a chamber in which to ring the bells. A porch has been added on the south side, with a carved figure of St. Cuthbert, the patron saint, and in a niche over the entrance. The chantry is a new construction, an organ-chamber and a priest's vestry. The restoration of the church was commenced in September, 1894, the architect being Mr. Edward Turner, Leicester. The contractors who have carried out the work are Messrs. Smith & Sons, Woolverley, near Kidderminster.

BOARD SCHOOL AT SAKMUNDHAM.—A board school has been opened at Sakmundham. The building forms three sides of a quadrangle, and consists of three rooms, comprising a large school, an infant school, and a class-room 60 ft., 40 ft., and 10 ft. respectively in length, with a uniform width of 10 ft. The quadrangle itself constitutes a sheltered playground, the open side of which faces south. On the west and east are the entrances, with cloak-rooms and lavatories attached. The building is carried out with red-facing bricks, with semi-circular windows of cut and rubbed red bricks. The roofs throughout are covered with Broseley tiles. The

corridors and cloak-rooms are paved with red Staffordshire tiles. The lavatory walls are built of white-glazed and salt-glazed bricks. The plaster of internal walls is everywhere protected by a wood dado 4 ft. high. The school-bell is hung in a turret, with lead canopy and spire, on the roof of the large room. The architect is Mr. T. E. Key, of London and Aldeburgh, and the contractor, Mr. W. Ingram Smith, of Woodbridge.

PARISH CHURCH, SKELMORLIE, N.B.—The new Parish Church of Skelmorlie has recently been opened. The new church has been erected from plans prepared by Messrs. John Honeyman & Keppie, Glasgow. The estimated cost of the building was over 5,000l., and many additions and improvements have been added since the building operations began. The old church was of a cruciform plan, and the transepts had to be taken down to make room for the new building. The old nave is to be used in future as a hall for Sunday-school and other congregational purposes. From this nave the new church extends in a south-easterly direction, and a massive tower with a short spire rises between the new and the old buildings. The dimensions of the church are 72 ft. by 43 ft., the chancel being 25 ft. by 15 ft. The plan is a nave with one side aisle separated from the nave by five small side aisles, and a chancel-chamber with openings towards the chancel and the side aisle. The arcading between the nave and the aisle, the chancel arch, the end and side windows, with their rear arches, are all built with the warm-tinted stone of the locality; and in the chancel, clustered shafts, mouldings, and dog-tooth ornament are freely introduced. The roofs are all of dressed timber.

The side windows of the chancel are of Skelmorlie stone, and a third step in front of the communion-table is of marble. The large three-light window in the gable of the chancel is filled with stained glass, the subjects being chosen from the life of Christ. In the central lancet there is the figure of the ascending Christ, while the side windows of the chancel are the Baptism and the Passion of the Redeemer. A feature of the chancel is the small three-light window in the side wall. The stonework of these side windows is finely-wrought, the windows being occupied by three stained-glass figures of notable Scottish saints—St. Ninian, St. Columba, and St. Kentigern. These windows are the gift of Mr. John Honeyman, one of the architects of the church. The glass has been executed by Messrs. J. & W. Guthrie, Glasgow. The vestry is placed at the south-east corner of the building, where there is a door of egress. The principal entrance is at the north end and in the base of the tower. The outer doorway is very deeply recessed, and the porch is lined with ashlar and paved with tiles. From this there is communication with the remaining portion of the old church, the old vestry, and the session-house, which is on the first floor of the tower. The builder was Mr. W. W. Oswald, Skelmorlie.

NORTH STAFFORDSHIRE ASYLUM, CHEDDLETON.—The foundation-stone of the new County Lunatic Asylum, which is to be erected at Cheddleton, near Leek, has just been laid by Lord Wrottesley. The site at Cheddleton was adopted by the County Council in 1892, and the Lunacy Committee were authorised to obtain plans and estimates for the new asylum. Subsequently premiums were offered for designs, and Mr. C. H. Howell, Consulting Architect to the Commissioners in Lunacy, was appointed professional adviser to the committee.

The result was the adoption of the plans and designs of Messrs. John Giles & Gough, of London, who were appointed architects to the building. The buildings are required to accommodate 600 patients—viz., 300 males and 300 females. The designs afford facilities for future additions to accommodate 800 patients without going beyond the limits of the site, with the requisite administrative offices for the latter number. The buildings will have a south-west aspect, and will occupy a position more than 500 ft. above sea-level. The design includes, in addition to the main buildings and offices, a chapel for 450 patients, superintendent's house, large recreation and dining-hall, with stage arrangements, two lodges, laundry, farm buildings, two workshops, infectious diseases hospital, mortuary, and airing courts. No boundary walls are required round the whole estate, but the airing courts are to be enclosed in such a way as not to obstruct the view. Provision is also made for warming, ventilating, cooking, and washing appliances and machinery, the water service, storage of rain-water, formation of roads, &c. All proper precautions will be made to prevent fire, and internally, for the prevention of fire, and to provide adequate means of escape in the case of fire. The infectious diseases hospital will provide for twelve beds, and will be placed 30 yds. distant from the main buildings, on the highest point of the site. The mortuary will also be completely detached from the main buildings. As a means of boring, a flow of water has been obtained on the asylum land. It has been decided to sink a permanent well of seven feet diameter to a depth of 110 ft., and the yield has been proved to be approximately 70,000 gallons a day. From this well the water will be pumped to a tower 100 ft. high, with reservoir holding 35,000 gallons. The buildings will cover an area of about eight acres. The bricks which are being used in the building are obtained in the locality from the Wall Grange Brick Company, and

the red sandstone dressings are from the Beggar's Wall quarries, near Alton. The common bricks for interior work are supplied by Mr. H. Warrington, of Berry Hill. The builders are Messrs. W. Brown & Son, of Salford. The clerk of works is Mr. H. Leboworth.

LIBERAL CLUB, YEOVIL.—A new liberal club has just been opened in Middle-street, Yeovil. The front of the building is of Ham Hill stone. The entrance is approached by a couple of steps of Keinton stone. The entrance-hall is laid with tessellated tiles. On the right-hand side is a large room for the Women's Liberal Club. On the opposite side of the hall is a men's reading-room. The library will be at the end of the entrance-hall, on the right-hand side; and the assembly-hall at the rear. Leading out of the lobby at the top of the staircase is the billiard-room. Adjoining is a large committee-room. The architects were Messrs. C. & C. B. Benson, of Yeovil, and the builder, Mr. Wallbridge.

RENOVATION OF TOWN HALL, COWBRIDGE, GLAMORGANSHIRE.—Cowbridge Town Hall has just been re-opened after renovations. Mr. C. B. Fowler, of Cardiff, was the architect, and Mr. Alfred Jones, of Cowbridge, the contractor. The hall will now seat about 100 more than before the alteration was made. On the ground floor there is a suite of rooms, and in the front is a new council-chamber, which will also be used as a police-court. Next to that is the mayor's parlour. There are cloak-rooms and lavatories, and two greenrooms for use in the case of entertainments.

THE CHURCH OF ST. MARIE REPARATRICE, CORK.—This church has just been dedicated. It was built by Messrs. E. & P. O'Hara, from designs by Mr. S. F. Hayes, architect. The high altar is of Gothic design, in keeping with the character of the church. Beneath the altar-table is a group representing the Nativity of Our Lord, terminating with a cluster of four pillars. Outside this, and finishing the line of reredos, are double credence stands supported by marble pillars. The reredos, which rises to a considerable height, is subdivided into four panels, containing carved and perforated inner panels bearing emblems of the Passion. The upper part of the reredos is panelled, gables being introduced for each of the arches. The throne or canopy is octagonal in form, terminating with a Celtic cross. Irish marble is introduced into the altar wherever possible. The architect of the altar is Mr. E. L. McDonnell, Dublin, and the contractor Mr. W. P. O'Neill, Dublin.

SCHOOLS, BILSTON.—The memorial-stones have just been laid in connexion with additions to St. Luke's Schools, Bilston. The schools at present hold about 300 children, and as a result of the improvement works now on hand, and which will cost some 1,300l., the accommodation will be so extended as to admit altogether about 475 children. The builder is Mr. H. Cave, of Wolverhampton, and the architect, Mr. R. J. Rowe, of Bilston.

NEW WORKHOUSE INFIRMARY, OTTERSHAW, SURREY.—A new infirmary has just been erected by the Chertsey Union Board of Guardians at Ottershaw. The work has been carried out by Mr. R. J. Hunt, of Chertsey, from the designs of Mr. C. Welch, architect.

RESTORATION OF SPAXTON CHURCH, SOMERSETSHIRE.—The parish church of Spaxton, near Bridgwater, dedicated to St. Margaret, has recently undergone restoration. The length of the church internally is 100 ft., and the width of the east wall of the chancel is about 12 ft., and the width from the north wall of the nave to the south wall of the aisle, about 33 ft. The oak bench-ends throughout the nave and aisle are richly carved. The dates 1536 and 1561 are cut upon two of them. The only structural alteration has been the erection of an organ-chamber with a vault for a heating apparatus under it. This has been effected by pulling down the west wall of the vestry and extending the vestry so as to give room for the organ to the westward, an arch being formed in the north wall of the chancel to receive the front of the organ. In order to insert this arch it was necessary to remove one of the ancient windows, which has been built in again in the north wall of the chancel, opposite its former position. The organ, which lately stood at the west end of the south aisle, blocking a window, has been remodelled and placed in the new chamber by Mr. W. G. Vowles, of Bristol, with a front projecting into the chancel, through the new arch. In the chancel has been laid a new floor of Maw's tiles. An embossed tile reredos by Maw has been placed against the east wall, and the choir stalls at the west end of the south aisle, which lately stood at the west end of the south aisle, blocking a window, has been remodelled and placed in the new chamber by Mr. W. G. Vowles, of Bristol, with a front projecting into the chancel, through the new arch. In the chancel has been laid a new floor of Maw's tiles. 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supported by wrought-iron standards, added. All the windows, none of which contained any remains of ancient glass, have been filled with tinted glass in new leadwork. The wagon-headed roofs of the south aisle and chancel-aisle are divided into panels by moulded ribs with carved bosses at the intersections. Some of the bosses were wanting, and these have been supplied. The plastered surfaces throughout the church have been cleaned and recoloured. The old stove and pipe smoke-flue having been removed, the church is now warmed by a system of hot-water pipes, arranged by Messrs. Skinner & Board, of Bristol. The contractor is Mr. H. W. Pollard, of Bridgewater; the glazing was prepared by Messrs. J. Bell & Sons, Bristol; Mr. W. G. Giles, of Wellington, performed the carving; and Mr. West, the village smith, made the hinges for the doors and the iron standards supporting the choristers' desk and pulpit-rail; Messrs. A. W. Blackler & Son, of Torquay, supplied the Devonshire marble. The work generally has been carried out from the plans and under the personal superintendence of Mr. J. Houghton Spencer, architect, of Taunton.

CHAPEL, PORTMADOC, NORTH WALES.—A new English Presbyterian Chapel and School is to be erected at Portmadoc, from the designs of Mr. T. Talliesin Rees, of Birkenhead. The chapel will accommodate 300 persons, with provision for future extension. The schoolroom is to seat 150, at the rear of which are kitchen, minister's vestry, heating-chamber, water-closets, &c. The design is in decorated Gothic style. The walls are to be built of local stone, with red Runcorn stone dressings and tracery, the internal work to be finished in selected pitch-pine. The contractor is Mr. John Shaw, of Birkenhead.

PREMISES, TOTTENHAM COURT-ROAD.—Messrs. Jas. Shoolbred & Co. are rebuilding that portion of their premises which stand at the corner of Grafton-street and Tottenham Court-road, from the designs of Messrs. Hovenden & Barber. Messrs. Holland & Hannen are the contractors, and the floors are to be freestone on the "Mark Fawcett" system.

NEW PARISH-ROOM AND CLERGY VESTRY, ST. MICHAEL'S, IPSWICH.—A new parish-room and clergy vestry were opened at Ipswich recently by the Bishop of Thetford. The buildings join up to the present church at the south-east end, and consist of a parish-room 39 ft. square, with scullery attached and entrances with vestibules from Bond-street and Upper Orwell-street, and a clergy vestry with door from same into chancel. The style of architecture is a simple form of Queen Anne. The cost has been about 1,200l. Mr. E. F. Bishopp was the architect, and Mr. William Grayston the builder.

NEW ALMSHOUSES, WETHERSFIELD, ESSEX.—These almshouses have just been completed, and were erected at the sole expense of Mr. Arthur Henry Gower, of Ipswich, as a memorial to his parents who, many years ago, resided at Wethersfield Hall. Mr. Gower has also provided an endowment fund for the future maintenance of the fabric. The range consists of four houses, raised on a terrace, each having a living-room, scullery, and other conveniences with verandah both back and front. The style is Elizabethan, harmonising with the ancient architecture of this interesting old village. The cost has been about 1,000l. Mr. E. F. Bishopp, of Ipswich, was the architect, and the builder was Mr. Alfred Brown, of Braintree.

METHODIST CHURCH, NEWQUAY, CORNWALL.—Corner-stones of the new building in course of construction for Claremont Free Methodist Church, Newquay, have just been laid. The building will be constructed of Cornish granite and Plymouth limestone. The style adopted is of the Perpendicular character. The dimensions of the building internally are length, 56 ft.; width, 36 ft., in addition to which there is an organ-chamber 22 ft. by 8 ft. 6 in. on the north side, which will be divided from the chapel by double arches. At the rear there will be minister's and choir vestries, with lobbies to each, communicating with the chapel, the slope of the ground admitting of a basement being placed under the vestries for stores, &c. Accommodation will be provided for 400 worshippers on the ground floor, and in an end gallery over the front entrance, vestibule, and lobbies. On the left hand of the main entrance will be a cloakroom, and on the right a staircase leading to the gallery. The roof is to be partially open, having wrought and pierced wooden principals resting on stone corbels, with wrought pins and iron tie-rods. The whole of the fittings will be in pitch-pine. The main front windows will have cusped and traceried heads, filled with leaded lights of geometrical design, the sides and vestry windows to be filled with enamelled glass. The architect is Mr. J. Ennor, jun., of Newquay, and the builder, Mr. John Collier, of Truro.

ST. MARTIN'S CHURCH, EXMINSTER.—On the 11th inst. the ancient church of St. Martin, Exminster, was reopened after undergoing renovation. The building is of red stone, and in the Perpendicular style. It consists of a chancel, nave, south aisle and south porch, and an embattled western tower, containing a clock and six bells. The roofs having been found to have become so unsound as to render some steps necessary to be taken before another winter, Messrs. Rowell & Son, architects, of Newton Abbot, were instructed to inspect the roofs, and to report to the Committee; and, after making a thorough examination,

they recommended that the slating should be entirely removed and the timbers laid bare, and if they proved not to be in too decayed and defective a state that they should be repaired and strengthened, or that, if necessary, an entirely new roof of oak should be substituted. The old timbers have been repaired and strengthened, covered with new slating on the outside, and a plastered barrel ceiling placed between the moulded ribs on the inside. New iron shuting and rain-water descending pipes have also been provided. In the interior, the western galleries have been removed, and the tower arch and western window have been opened to view. The font, erected in 1843, has been mounted on a new base, and placed in the tower. The former pews have been replaced with oak seats, and the floors under them laid with wood blocks. The aisles have been relaid with the paving stones removed from the former aisles. The whole of the works have been carried out by Mr. Herbert Read, of Exeter, under the direction of the architects, Messrs. Rowell & Son.

CHURCH, CARLTON MINIOTT, YORKSHIRE.—The foundation-stone of the new church at Carlton Miniott (Thirsk) was laid on the 9th inst. The new edifice is to occupy the site of the ancient Parish Church, which for many years has been in a state of decay. The architect is Mr. Hodgson Fowler, of Durham, and the contractor Mr. Harwood, of Marfield, Darlington. The cost of rebuilding, furnishing, &c., of the church is estimated at 1,200l.

CHURCH OF ST. NICHOLAS, KELVEDON HATCH, ESSEX.—The new church and churchyard of St. Nicholas, Kelvedon Hatch, were consecrated by the Bishop of Colchester recently. The church, which is in the Early English style, is built of red brick, with a red-tiled roof, while above the entrance porch rises an oak spire, surmounted by a weathercock, and containing the bell which was in the belfry of the old church. The new church has been built on a site which covers an acre. The old Parish Church is situated about a mile and a half from the village. The church will accommodate nearly 250 persons. The roof is of oak, and the flooring is of wood blocks, the seating being carried out with the benches from the old church. The artificial lighting is by means of brass oil lamps hanging from the ceiling, and the heating is carried out by hot air. The font from the old church has been removed to the new building by Mr. T. W. Haws, of Brentwood. The architect of the new building is Mr. J. T. Newman, of Kelvedon Hatch. The church was erected by Mr. John Gozzett, of Maldon.

RECONSTRUCTION OF STRANRAER ACADEMY, VICTORIA.—This building has been reopened after reconstruction. The building was gutted by fire almost a year ago, and soon afterwards the work of reconstruction was proceeded with. The architect was Mr. James Caird Macfarlane, Stranraer.

THE BIRMINGHAM AND MIDLAND EYE HOSPITAL.—On the 9th inst. the Viscountess Newport performed the ceremony of declaring the new wing of this building to be open and ready for occupation. The work which is now completed is an important addition to the hospital which was re-erected on the present site at the corner of Church and Edmund-streets into a new building erected for its accommodation in 1884, a description of which was given in the *Builder* in vol. xlii, page 91. Hitherto the children admitted into the hospital have been placed in the female side of the building, but this having been found objectionable both from a medical point of view, and to the comfort of the patients, it was decided to erect a separate department for children. The new work consists of an extension of the Edmund-street frontage carried out in conformity with the original design. The accommodation consists of wards for thirty children, a day room, ward kitchen, linen room, bath room, lavatories, &c., all upon one floor level, bedrooms for most of the staff of the whole institution, enlargement of the out-patients' department, and improved accommodation in the male wards; the two lower floors of the new buildings (at present let off as professional offices) being reserved for future accommodation. The work has been carried out at a cost of about 5,000l. by Messrs. J. Harley & Son, contractors, of Smethwick, from the designs of Mr. Henry F. Tabor, architect, of Birmingham, who, in conjunction with the late Mr. E. J. Payne, was architect of the main building in 1884.

UNDERGROUND CONVENIENCE, COLCHESTER.—An underground lavatory and convenience has just been constructed in Colchester near the Town Hall, at a cost of 320l. The walls are constructed of concrete 15 in. thick, faced with glazed bricks supplied by the Farnley Ironworks Co. The floor is paved with black and red Milton tiles, and the steps are of concrete, with Doulton's slip-treads. The whole of the roof is utilised for light and ventilation, Messrs. Hyatt & Co. supplying the pavement lights and grates. The water-closet, urinal, and lavatory fittings were supplied by Messrs. Doulton & Co. The urinals are circular in section, with white glazed stoneware backs, and the closets are wash down, of the "Simultaneous" pattern. The accommodation consists of five urinal stalls, two water-closets, a lavatory, and a room for the attendant. Mr. H. Goodyear, Borough Surveyor, was the engineer, and Mr. Beaumont of Colchester the contractor.

SANITARY AND ENGINEERING NEWS.

SEWERAGE WORKS, GODALMING.—These works formally opened on the 4th inst. by the Mayor Mr. W. C. Gilman. The outfall works are situated at Unstead, about one mile outside the borough, the sewage being conveyed there in a cast-iron sewer 21 in. diameter. From the receiving well it is pumped through a rising main to the precipitation tanks. The two sets of pumping-engines are the Worthington triple expansion type, erected by Messrs. J. Simpson & Co. of Pimlico. The tanks are three in number and the sewage, being chemically treated after passing through them and through coke filters, is taken on to specially-prepared land about thirteen acres in extent. The scheme also includes the whole of the sewers and branch drains inside the borough. The engineers are—for outfall works and northern section of sewers, Mr. Henry Moon, Godalming. For the southern section, Mr. S. Weiman, Borough Surveyor. The whole of the works have been carried out by Mr. W. Cunliffe of Kingston-on-Thames at a cost of 36,000l.

NEW PUMPING MACHINERY, HEREFORD WATERWORKS.—New pumping-engines have recently been erected under the management of the Waterworks Committee of the Hereford Corporation. The following particulars are taken from a short report read by the City Surveyor on the occasion of the starting of the engines (which was formally done by the Mayor of Hereford).—The question of improved pumping appliances at the Waterworks pumping-station has long engaged the attention of the Waterworks Committee, and on February 13 last year the City Surveyor reported that the old engines were unreliable and very extravagant in the use of fuel, and costly in repairs. The Committee being desirous of obtaining the best possible plant at the least expenditure, and having obtained tenders, deputed a Sanitary Committee to visit the works of the Hartlepool and West Middlesex Companies at West Hartlepool and Hammersmith, where engines and pumps were in operation constructed by the firms whose tenders were lowest. This the Sanitary Committee did on May 25 and 26 of last year, and unanimously recommended that the tenders of Messrs. Worth & Mackenzie be accepted, subject to the approval of the Council and the Local Government Board. A Local Government inquiry was held before Colonel Luard on September 28, 1894, where the scheme was recommended for approval, and the sanction of the Local Government Board was subsequently obtained for borrowing powers of 3,800l. for this purpose. Messrs. Worth & Mackenzie's tender was then formally accepted for the engines, &c., and that of Messrs. Bowers & Co. for the buildings, &c., in accordance with the following description:—The engine is of the triple-expansion, condensing type, direct acting with overhead marine pattern cylinders 13½ in., 21½ in., and 36 in. diameter by 30 in. stroke, driving three single acting ram pumps 16 in. diameter lifting 120,000 gals. per hour. The engine-house, erected by Messrs. Bowers & Co., is arranged to correspond with the existing buildings, and the floor is depressed 1 ft. 3 in. below the old engine-house floor, in order to reduce the suction as far as possible. All special pipes and valves are so arranged as to provide for future extensions, if required, and two valves with standards and hand-wheels with 26 in. cast-iron reflux valves, one operation regulate the supply to the tower of storage reservoir without stopping the engine. The method of operating these valves (which may be distinguished as A A' and B B') is as follows:—Suppose valve A to be shut and valve B open, the high lift pumps are then pumping river water from the well into the storage reservoir through valve marked B and A', which open automatically, valve B' being at the same time automatically closed owing to the pressure from the water-tower being so much greater than the pressure in the 14 in. main. When it is required to pump water to the tower, valve A is opened and the pressure of water from the clear water reservoir automatically closes valve A'. The engine-man then closes valve B and the pressure of water from the high-lift pumps at once opens the reflux valve B', when the pumps commence delivering clean water to the tower. It takes the man about one minute to close valve B, during which time the engine will have made about twenty-five strokes, pumping filtered water through valve B into the 14 in. main, thus throwing into the 14 in. main all the water from the 6 in. pipes before the pump commences delivery to the tower. This arrangement is much better than that of disconnecting the high-lift pumps, which would have rendered a stoppage of the engines necessary each time the tank on the tower was filled. The duty performed by the old h.p. pump is performed in an economical manner by a pair of high-lift pumps attached to the intermediate engine, capable of delivering 15,000 gallons per hour, either to the tower or reservoir at pleasure. It should be added that the works have been completed within the estimate.

NEW WATERWORKS, LAUNCESTON.—New waterworks were opened at Launceston by the Mayoress (Mrs. John Kitterton) on the 31st ult. From the source at Carne Down to the reservoir there is a fall of 22 ft. Of circular form, the reservoir itself will contain 350,000 gallons, equal to about three days' supply. It has been constructed of clay puddle, both at the bottom and sides, with a con-

ete lining coated with cement. It is 250 ft. above the reservoir, the lowest part of the town. At the reservoir a pressure reducer has been fitted, at a by-pass has been constructed, enabling the water, if necessary, to pass direct from the source to the town. The reservoir is protected by an outer wall of granite, with stone coping and iron railings, and an inner dwarf wall, with ornamental railings. The space between the two walls will be laid out with flower-beds. The contract for the service reservoir was carried out by Mr. R. G. Burt, Launceston, and the construction of the intake works and the laying of the pipes by Mr. Joseph Fisher, of Millbrook, for 2,500, and 1,250, respectively. The pipes were supplied by Shaw & McInnes, of Glasgow, the amount of their contract being 3,678, and the pipes by Blakeborough, of Brigg House, Yorkshire. McDwen has discharged the duties of clerk of the works. Including the acquisition of the water-rights and easements, and the purchase of the windmill, the total cost of the work has been about 9,500. Mr. S. Jenkins, of Liskeard, was the engineer of the works.

THE GORTON SEWER WORKS.—To mark the completion of the Gorton sewer scheme, a ceremony took place on the 6th inst., at which Dr. W. McArthur (Chairman of the Gorton Urban District Council) set the works in operation. A gold ring, the gift of Mr. F. Candy, managing director of the International Water and Sewage Purification Company, was presented to Dr. McArthur by Mr. T. Holland, Clerk to the Council. Before the completion of the scheme the whole of the sewage of the township went into Gorton Brook and Gorton Brook without having received any treatment at all. The Mersey and Irwell Joint Committee, however, served the Council with a notice requiring it to do so, and the whole of their sewage went into the streams within given time. A scheme was therefore, prepared dealing with the entire township, and consisting of main concentrating and several tributary sewers. Application was then made to the Local Government Board for sanction to borrow the necessary money, which was estimated at 100,000. The Local Government Board, however, gave its approval to the plan, and sanctioned the loan which its adoption involved.

The plan of the ground was secured near Belle Vue Gardens, and the first sod was cut in 1893. The engineers have been Messrs. Lomax & Lomax, of Manchester, and under their direction the work has been carried out. Mr. Daniel Eadie, of Stockport. There are two tritatus tanks with a capacity of 100,000 gallons, and three large precipitating tanks with a combined capacity of 2,000,000 gallons. The sewage, on entering the tanks, passes into the two tritatus tanks, having first received a dose of ferrous sulphate to effect a complete precipitation of the heavier suspended matter. From these it flows into the precipitating tanks, where the lighter suspended matter is deposited. The sewage, having been treated, is then pumped into the filter-beds of a superficial area of 2,660 sq. yds. The whole scheme is designed to meet the requirements of a pure prospective population, and it possesses a convenience, said to be unique, in that the tanks and filter-beds are able to deal not only with the sewage, but also with a half-inch of rainfall over the entire area. It is not intended in future to deal with the sewage deposited in tanks, and the filter-beds, but this is not yet included in the scheme. The filter works have cost 17,000, and the concentrating sewers have involved an expenditure of 100,000 more. Other important sewers are about to be carried out, and when completed the whole of the sewage from the township will be conveyed to the Outfall Purification Works, and the pollution of the rivers, so far as Gorton is concerned, will be at an end.

PUBLIC IMPROVEMENTS, COLWYN BAY.—On the 6th inst. Col. W. L. Coke, J.P., D.L., Inst.C.E., held an inquiry, on behalf of the Local Government Board, into the Colwyn Bay and Llandudno District Council's application to borrow a sum of 12,000 for the construction of a promenade on the foreshore; 6,771 for works of drainage, and 3,847 for works of street improvement. There were present amongst others, Mr. Jas. Carter (Clerk to the Council) and the Surveyor (Mr. A. Jones, A.M. Inst.C.E.). The Surveyor said that portions of the foreshore now taken over by the Council would be covered by the proposed works. The length of the promenade would be 1,450 yards, and it would extend, from about the middle of the promenade, to a point beyond the public house which at present ran to the main road at the Marine Hotel. The maximum width of the promenade would be 125 ft. The promenade would be built of limestone in cement, and a path, 10 ft. wide, would be included on the seaward side. The minimum width of the promenade would be 65 ft. They intended to build a sea-wall along the outer face of the promenade of an average height of 9 ft. from the coping to the bottom of the wall. That included the coping. That wall would be built of limestone in cement, backed to its thickness with concrete. The average thickness would be 3 ft. 3 in. The latter on the face would

be one in four. That wall would have shingle for its foundation. They had at present on the beach a shingle wall which had stood for the last five years against very severe gales. Every yard of that wall weighed between 35 and 40 tons, so that he thought that that was sufficient evidence as to the stability of the foundation. The depth of that wall was only about 5 ft. below the surface, while the new wall in front would go down about 5 ft. deeper still. The greatest scour that he had ever seen on the beach was about 3 ft., but he should inform the Inspector that this was brought back again, so that there was a continual process of scouring and filling going on on the beach. They would continue the promenade from one end of the wall to the other. They would have a kerb and channel on each side of the road. The surface of the promenade would be covered with a 5-in. layer of tar-paving, and the road would be pitched and macadamised. The average height of the coping of the wall would be 2 ft. 4 in. above the foreshore. For the convenience of bathing-machines, bath-chairs, and horses, that it was desired to take down to the sands, he had provided slopes of 1 in 25 down to the shore. Two additional approach roads would be made—one in the middle, and one at the end—and it was the intention of the Council to extend the Promenade both eastwards and westwards. The Inspector visited the site of the proposed promenade, and the inquiry terminated.

WATER SUPPLY, BAMFORD, DERBYSHIRE.—The Parish Council of Bamford have agreed upon the adoption of a scheme prepared by Messrs. Sterling & Swann, whereby the whole of the village will be supplied with water.

STAINED GLASS AND DECORATION.—WINDOWS, ST. AIDAN'S CHURCH, LEEDS.—Two stained-glass windows have recently been added to this church. They are the west window of the baptistry and the west window of the morning chapel. The former represents the three phases of Baptism, the latter "two of Our Lord's appearances after the Resurrection." They are executed by Messrs. Percy Bacon & Bros., of London.

ENCAUSTIC TILE FLOOR, CLEVELAND HOUSE.—The *Pottery Gazette* gives a description of a tile floor executed by Messrs. Minton, Hollins & Co. for Mr. Astor, the present owner of Cleveland. The floor is 25 ft. 8 in. by 23 ft. 8 in., and has been specially designed for the situation. On the outer border are figures of Cupids, white on a Jasper blue ground, holding wreaths the ends of which are attached to a vase in the form of a fountain. At the top of the columns or pilasters in the centre of the floor are allegorical figures in white upon a Jasper ground, the figures being relieved by touches of green. The Elements are represented by four allegorical pictures, and in the centre of the pavement the mask of Medusa is portrayed. The colours of the tiles used are blue, white, grey, buff, black, green, and purple.

SCULPTURE FOR ASSURANCE OFFICES, CALCUTTA.—Messrs. Harry Hens & Sons, of Exeter, have just completed a set of colossal pieces of sculpture, weighing in all about thirty tons, which are to be placed on the main front of the new Standard Assurance Offices in Dalhousie-square, Calcutta. They consist of allegorical statues representing "Life" and "Death." Besides these, there is a pediment 30 ft. long with ten female figures therein, each 6 ft. 6 in. high, sculptured in the round. They represent the five wise and five foolish Virgins, and are destined for the main gable of the new edifice. There is also a statue of "Atlas," which stands 9 ft. high. The architect for the new building at Calcutta is Mr. Frederick W. Stevens, Companion of the Indian Empire.

FOREIGN AND COLONIAL.

FRANCE.—The artistic jury of the International Exhibition has just given their decision on the open competition for the execution of a diploma. The first prize has been awarded to M. Roedel; the second to M. Dillon. M. Falguère has just finished a magnificent bust of Renan, which the State commissioned him to execute for the College de France.—The Committee on the Victor Hugo monument as given the execution of it into the hands of the sculptor Ernest Barrias. It will be placed on the "round-point" of Place Victor Hugo, and will represent the poet, in modern dress leaning on a rock. At the four corners of the monument, which will be in granite and bronze, there will be symbolical figures, of Epic poetry, Lyric poetry, the Drama, and Satire.—The Municipal Administration of Paris intend to cover the Canal Saint Martin, which at present is open from the Place de la Ville to the Boulevard Richard Lenoir. The top of the canal arch will be laid out with grass-plots, flower-beds and fountains.—A competition will shortly be opened for the building of a Conservatoire de Musique and an Ecole des Beaux-Arts at Lille (Nord).—The Parisian Bureau has commissioned the execution of the monument which it proposes to raise to the memory of President Carnot, to the sculptor Loiseau-Bailly, and the architect Deschamps. This monument, which is to be eight metres high, consists of a pyramid supporting the bust of Carnot, above which is a winged figure of Immortality. On the stand is a figure engraving a

funeral inscription.—M. Airas, architect at Angers, has obtained a gold medal for the building of the National Exhibition which is to be held in this town. Gold medals have also been awarded to the architects Mongenot (of Epinal) Le Châtelier (of Paris) and Maillard (of Angers).—The Government have just sanctioned the making of a line from Etampes to Beaune-la-Rolande by Pithiviers. The expense is estimated at 9,076,000 francs.—The sculptor Cordonnier has just finished the monument of the singer Gustav Nadaud, which is to be erected at Roubaix in a few months. It consists of a statue, surmounted by a bust. Two figures representing Song and Poetry lean towards him. There are two bas-reliefs representing two favourite songs, "Les Vendanges" and "Les Gendarmes."

MISCELLANEOUS.

CARDIFF COUNTY COUNCIL ELECTION.—Mr. Fred. J. Veall, of the firm of Veall & Sant, architects, Cardiff, was on the 1st inst. elected to the Council of the County-borough of Cardiff, for the Riverside Ward, polling the largest number of votes ever recorded for any candidate in that ward. Improved sanitation and better building inspection were the two strongest points upon which Mr. Veall insisted in his address and at his public meetings.

THAMES FLOODS PREVENTION.—A meeting of the Thames Floods Prevention Committee was held at the Windsor Guildhall on the 7th inst. for the purpose of protesting against the inaction of the Thames Conservancy with reference to the measures suggested for averting or minimising the inundations which are periodically experienced in the district.

Mr. H. Webber, the mayor, presided. On the motion of the Rev. Dr. Warre, seconded by Mr. Heaton, the following resolution was agreed to:—"That this committee desires to express its dissatisfaction that practically no steps have been taken by the Thames Conservancy to mitigate the severity of floods in the Thames valley, although a year has elapsed since the destructive flood of November, 1894, and that a deputation be appointed to wait upon the President of the Board of Trade to lay the whole subject before him, and to ask him if the Government can afford any assistance to the committee in the important object which it has in view."—It was also agreed to appoint a sub-committee to draw up a memorial to the President of the Board of Trade requesting him to receive the deputation.

THE REBUILDING OF HIGHGATE ARCHWAY.—The rebuilding of Highgate Archway will not be the speeded for some little time. The London and Middlesex County Councils, Islington Vestry, and Hornsey District Council, who were to jointly carry out the work at a cost of about 27,000, are now going to confer as to whether the new structure shall be of iron or stone. It is iron is used there will be a saving of about 6,000, or 7,000. The London County Council and the Islington Vestry favour iron while the Middlesex County Council and Hornsey District Council are for stone. One reason given by the latter bodies is that the New River Company, whose pumping-station adjoins, object to an iron bridge, but as they are not going to contribute a single farthing towards the cost of the work it is difficult to understand why they are being considered in the matter.—*Daily Chronicle*.

THE EAST LONDON WATER COMPANY'S RESERVOIRS.—The work of constructing the new reservoir for the East London Water Company at Haggerston, Walthamstow, has been seriously interrupted. The centre arch of the massive central wall has given way and tons of earth banked behind it have fallen down. Had the mishap happened during the day when the men were at work it is probable that it would have been attended by many fatalities. As it was no personal injuries were sustained. One result of the unfortunate occurrence is that a large number of men have been temporarily thrown out of employment.—*Essex Chronicle*.

THE VESTRIES AND THE WATER SUPPLY.—At the ordinary fortnightly meeting of the Bermondsey Vestry on the 4th inst., presided over by Mr. A. Pomeroy, the Finance Committee reported that an account was sent in to the Southwark and Vauxhall Water Company, amounting to 144l. 18s. for supplying the inhabitants of the parish with water during the severe frost of last winter. The company had written stating that they could not accept or recognise any liability or responsibility whatever in the matter. Mr. Ball said he was not sure whether the Vestry had any real claim on the company, but the Committee were strongly of opinion that the money should be paid. If the company continued in their refusal to pay the money, he believed the Vestry had no power to force them to do so. He moved the adoption of the report. Mr. Maule seconded, and said the Lambeth Waterworks Company had reimbursed the Vestry in a similar case, and he thought the Southwark and Vauxhall Company should be made to do the same. The Vestry ought also to express their opinion of their sense of the injustice of the matter. The report was adopted, and it was decided to send two of the officials of the Vestry to see if they could come to any settlement with the waterworks company. The General Purposes Committee reported the receipt of a letter from the Lambeth Water Company asking if the Vestry would be prepared to assist the company in supplying house-holders with water by means of water carts in the

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS

Nature of Work.	By whom Advertised	Prize-money.	Deadlines to be delivered.
Sewerage Scheme	Wantage U.D.C.	25 Guineas	Nov. 28
Rebuilding Infirmary	Manchester Royal Infirmary	20l. each	Nov. 30
Public Baths	Lincoln Corp. ....	.....	.....
Recreation of Club Premises	Woking, Harefield and District Conservative Club Co. Ltd. ....	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Enlargement of School of Art	Borough of Crews	J. Stevens	Nov. 19
House and Office, Hatfield, White House	D. Wals	H. L. Tison	do.
New Street near Aldgate	Rev. J. Kelly	do.	do.
Island, Bournemouth, Island	Langston U.D.C.	do.	do.
Water Main of 600 yds. &c.	Wotton U.D.C.	do.	do.
Seats and Fitting Public Library	Tottenham U.D.C.	do.	do.
Shop, at Morley-lane	Leeds U.D.C.	do.	do.
Brick Sewer, Boxton-road	Starport Corp.	A. E. Preston	Nov. 23
Cast-iron Pipes 600 yds. &c. Grewelthorpe	Ripon R.D.C.	do.	do.
Cast-iron Water Pipes and Castings 4,300 yds. Kirby Mabeard	do.	do.	do.
Laying Cast-iron Pipes 3,500 yds. Grewelthorpe, Yorks	do.	do.	do.
Stable and Coachhouse, Bieldthorpe, Bridlington Quay	do.	do.	do.
Recreation, &c. Coachhouse Farm	do.	do.	do.
Rebuilding Chapel Mill, Batley	do.	do.	do.
County Drainage	Blackburn Corp.	do.	do.
Water Supply, Brecon, near Raglan	La. Laidlaw F.D.C.	do.	Nov. 21
Fireproof Sanitary Pipes, West Moor	Tynemouth R.D.C.	do.	do.
Defence, Cheltenham-Sea	C. G. R. R. D.	do.	Nov. 23
Brick Sewer, at near Bury Bridge	Bury (Lancs) Corp.	do.	Nov. 23
Bakery, Abbotston, at Stanley-street	Colne (Lancs) Dist. Co-op. Soc.	do.	do.
Ballist House	Tunbridge Wells T.C.	do.	do.
Erection of Infectious Hospital	East Grinstead U.D.C.	do.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Paving New Streets	Canterbury Vestry	O. S. Brown	Nov. 1
Sewerage Work	Ashton-under-Lyne Corp.	Official	do.
Paving, &c. Upper North-street	Laton T.C.	do.	Nov. 28
Cast-iron Water Pipes 1800 tons	Latham and Burscough U.D.C.	Wood & Brodie	do.
Grass	Willenden D.C.	O. Claude Robson	do.
Roadmaking and Paving Works	Sch. Rd.	Gutteridge	do.
Schools, Offices, &c. Chamberlayne-road	Bury (Lancs) Corp.	J. Cartwright	do.
Kerb, Setts, Haslingden-street	Patience and Bate	Wood & Brodie	do.
Laying, &c. 20,000 yds. Cast-iron Water Mains	South U.D.C.	do.	do.
Sewering, Draining, &c. Mills Hill-road	Widenedon (Lancs) Corp.	W. Welburn	Nov. 27
Making-up and Paving Ryecroft-street	Fulham Vestry	C. R. R.	Nov. 28
Mill, Engine-house, &c. Leeds-road	Harrow Corp.	J. R. R.	do.
Waterworks and Pipe Laying 2,000 yds. &c.	Sheffield Gas Light	do.	Nov. 30
Electric Paving	do.	do.	do.
Elne Pontant Kerbing, &c.	N. S. M. (Surrey)	T. V. H. Davidson	do.
New Road, Skipton, Moor, Sleights, Yorks	J. R. R.	do.	do.
Rebuilding, &c. Leeds-street	Robinson & Co.	J. R. R.	do.
Paving Work	Gloucester & Glos. L. B. & S. C. Ry. Co.	do.	Dec. 14
Construction of Railway	do.	do.	do.
Colliery	Mr. Donald	do.	No date
Six Cottages, Cwmtillery, Wales	F. Fielding & Co.	E. A. Llanfyllon	do.
Additions, &c. to Theatre, Hull	do.	Thos. Robinson	do.
Infirmary, &c. to Theatre, Hull	do.	Smith & Co.	do.
Infirmary, &c. to Theatre, Hull	do.	do.	do.
Infirmary, &c. to Theatre, Hull	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Chief Resident Engineer	L. B. & S. C. Ry. Co.	1,000l.	Nov. 23
Engineer	do.	do.	Nov. 27
Resident Engineer and Clerk of Works	Portsmouth U.D.C.	3l. 10s. weekly	Nov. 30

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. lv. Contracts, pp. iv, vi, vii, & xviii. Public Appointments, p. xvi.

event of a severe frost, and inquiring what the charge would be per day, including a horse and two men, and the Committee advised that the company should be informed that the Vestry was prepared to do so. This was agreed to, and it was also decided that a communication should be sent to the Southwark and Vauxhall Water Company stating that the Vestry were also prepared to supply them in a similar manner.

THE LONDON WATER INQUIRY.—The inquiry into the supply of water in London for sanitary purposes was resumed on the 7th inst. at the Guildhall, Westminster, before Colonel Ducat, C.E. Sir Frederic Bramwell, examined by Mr. Pember, Q.C. (for the companies), said that in his opinion the three-gallon flush demanded by the County Council was not only unnecessary, but harmful; the present two-gallon flush was ample. The quantity used for flushing purposes had very much increased during past years, and any further and compulsory increase would mean an early enlargement in the capacity of the mains. In cross-examination Sir Frederic said an increase of one gallon in the flushing capacity of cisterns would mean an increase in the water-supply of 10,000,000 or 12,000,000 gallons daily. This was the evidence on the part of the companies. Mr. Freeman (for the London County Council) then put into the box Mr. Walker, Superintendent of the County Council-buildings in East Greenwich, who said that he had charge of 3,400 tenements. During the past twelve months there had been twenty-one stoppages from drains other than by frost.—Mr. Satchwell, superintendent of the County Council-buildings in Hughes-fields, gave similar evidence.—Mr. Pember, Q.C., then summed up on behalf of the companies. He submitted that they were called upon to make good the defects of the sanitary engineer, the plumber, and the architect in the sanitation of houses. Water was far too precious a commodity to be wasted in these days when water-sheds were being snapped up. He maintained that there was no greater waste of water going on anywhere, and no worse fittings put in anywhere, than in the county of London. Therefore his contention was that new regulations ought not to be made until something had been done to prevent the large waste of water which now went on. Regulations such as the County Council sought would mean the expenditure of a million a year. Given a good cistern, a proper down-pipe of 4-in. diameter, a proper pan, and a good short-hopper pan with a proper rim, and he maintained that the evidence he had adduced showed that a two-gallon flush was ample.—The inquiry was then adjourned until the 8th inst. when Mr. G. M. Freeman, on behalf of the London County Council, replying generally on the case submitted by both sides to the inspector, said he fully concurred in what had been said by his learned friend, Mr. Pember, as to the great importance of this inquiry from a public point of view, though he (Mr. Freeman) estimated that importance mainly

from the sanitary necessity of having a sufficient water supply to flush the house-drains of the Metropolis in an efficient manner with a view to the preservation of the health of the population. In advocating the desirability of substituting a three-gallon for a two-gallon flush, the learned gentleman put it to the inspector why, when the Municipal Authorities of Edinburgh, Bradford, Croydon, Plymouth, and Gloucester had found it necessary to resort to the increase of one gallon on the two which had previously been considered requisite, that which had been deemed a public requisite in these populous provincial centres should not also be needed in the Metropolis. In conclusion, he argued that the requisites insisted upon by the witnesses examined on behalf of the companies as essential to the efficacy of a two-gallon flush were so numerous and exacting as in reality to put their case outside the range of practical application. The County Council asked for no retrospective order, but merely that in all future cases the fittings should be such as would give at least a three-gallon flush. As to the evidence put forward on behalf of the water companies with regard to the enormous increase of water supply that would be necessitated if the proposal made by the County Council were adopted, he contended that the figures given had been ridiculously exaggerated. He claimed that a sufficient case had been made out for the demand made by the County Council, that the demand had been made after due consideration of the necessity for what was asked in behalf of the sanitary needs of the population, that neither in the inception of their proposal nor the conduct of their case had the County Council been actuated by any feeling of hostility to the water companies, but merely by a desire to promote the general good of the community, and that upon a review of the whole of the facts it would only be right and reasonable that the water companies should be required to comply with the demand made upon them by the body representing the interests of the inhabitants of this great Metropolis.—This concluded the inquiry, and arrangements having been made for an inspection by Colonel Ducat of some of the representative blocks of artisans' dwellings in the districts served by different water companies, the proceeding terminated.

MEMORIAL TABLET, DANBURY CHURCH, ESSEX.—The unveiling of the tablet to the memory of the late Sir T. P. Bridges, Bart., took place recently in the Danbury Parish Church. The memorial is the design of Mr. Arthur Bartlett, architect, of London.

ART AND INDUSTRIAL EXHIBITIONS.—A loan exhibition of pictures, engravings, old prints and books, foreign and other curios, old prints and amateur work was opened on the 4th inst. in Paris-street, Exeter.—The National Trades and Industrial Exhibition, in the East End Exhibition Buildings, Glasgow, was opened on the 4th inst. by Bailie Ure Primrose.—On the 4th inst. an industrial exhibition was opened in the Corn Exchange, Haddington,

under the auspices of the East Lothian Industrial Association. There are four principal sections, comprising needlework, mechanical work, decorative work and furnishings, and painting, drawing, engraving, and photography. An interesting adjunct to the industrial exhibition is a large loan collection, displayed in the side room of the Exchange. This collection was brought together principally through the efforts of Lady Grizell Baillie Hamilton, and contributions were sent from several of the county mansions.

SURVEYORS' INSTITUTION.—At the ordinary meeting of this Institution on Monday last in Great George-street, Westminster, it was announced that the Institution is about to follow the example set by the Civil Engineers, on the opposite side of the street, by erecting a new building of extensive dimensions. Mr. D. Watney, in delivering his opening address as President, said the new building would be worthy of the Institution, which had long ago outgrown its present home. The address covered a wide range of subjects, such as betterment, the price of land, local taxation, and agricultural depression, a remedy for which, the President thought, might be found in organisation and co-operation. Forestry was referred to as a subject to which the Council were devoting special attention, and in the new building there would be a department in which that important branch of surveying could be studied.

THE EXCAVATIONS AT DORE ABBEY.—The excavations on the site of the nave of the Cistercian Abbey of Dore, about twelve miles from Hereford, and at the southern end of the Golden Valley, have revealed the position of the west wall at its north-west corner, and also the bases of all the columns except two, which supported the north arcade. The nave was of nine bays, divided by circular columns 3 ft. 6 in. in diameter, and standing on square bases or plinths. At the second column west of the crossing the base of the great rood-screen was found, partly composed of thirteenth-century worked stones reused. Many of these still retained traces of colour, and fragments of a shrine or tomb found close by were also elaborately coloured and gilded. The rood-screen crossed the aisles as well as the central alley. Some screenwork was found of stone, of the thirteenth-century, also fragments of armorial and embossed tiles. The excavations have been made by Mr. Roland Paul.

A. A. CAMERA CLUB.—At the meeting of this club last Wednesday, a paper on "Canterbury Cathedral" was read by Mr. Charles H. Freeman, illustrated by lantern views of various parts of the building taken by two members on the occasion of the visit of the club to Canterbury two years ago. No opportunity had presented itself of showing their work on the screen; but this was done on Wednesday, and the historical and architectural notes contributed by Mr. Freeman helped to make an interesting and instructive exhibition.

LEGAL.

COST OF REPAIRING A DEFECTIVE DRAIN:

DER THE METROPOLIS MANAGEMENT ACT, 1855. HE case of Florence v. The Paddington Vestry, which came before Mr. Justice Chitty in the ancillary Division last week, raised an important question as to the cost of repairing a defective drain under Section 250 of the Metropolis Management Act, 1855.

The facts are shortly as follows:—In 1804 the infant purchased the freehold of Nos. 149 and 151, Arch-street, Paddington, and shortly afterwards received from the defendants a notice to repair a defective drain. The plaintiff opened up the drain, and then discovered that premises at the rear adjoining to another owner were drained into the drain. The plaintiff then claimed repayment by the defendants of 47*s.*, the sum expended by him in repairing the drain, on the ground that it was a rer within the meaning of Section 250 of the Metropolis Management Act, 1855, and therefore enforceable by the Local Authority. The connexion between the drain made about thirty years ago by the defendant and the then occupant of the Church-end houses and without the authority of the Vestry. The plaintiff, when he purchased the property, made no special inquiry as to the origin.

His Lordship, after hearing evidence and the arguments of counsel, said that the case of *Kerwin v. Taylor*, (L.R. 1895, 2 Q.B. 471), governed the case in question. The connexion in the present case was made without the consent of the Local Authority, or the owner of the house. In *Kerwin v. Taylor* a scheme of drainage had been approved by the Local Authority, but the drains constructed were in accordance with the scheme, consequently, in that case the drain was unlawful, and not the other way round. The connexion in the present case was unlawfully made, but plaintiff did not claim under the person making unlawful connexion. The plaintiff had no notice of anything unlawful had been done, and further, was not bound to inquire as to another's acts. His Lordship, in giving judgment, said that the plaintiff was entitled to a declaration that the drain was lawful, and to be repaid the money he had expended repairing it.

Mr. Byrne, Q.C., and Mr. R. F. MacSwiney represented the plaintiff; and Mr. Farwell, Q.C., and Mr. Nash, the defendants.

MEETINGS.

FRIDAY, NOVEMBER 15.

Sanitary Institute (Lectures for Sanitary Officers).—W. C. Tyndale on "House Drainage." 8 p.m.

MONDAY, NOVEMBER 18.

Royal Institute of British Architects.—(1) Presentation of the Portrait of the ex-President, Mr. J. Macvicar.

(2) Dr. A. S. Murray, F.R.S., on "The Sculpid Columns of the Temple of Diana at Ephesus."

8 p.m.

Artistic Architectural, Engineering, and Surveying Society.—Mr. P. Fitzgerald on "Robert Adam and his Architecture." 8 p.m.

TUESDAY, NOVEMBER 19.

Institution of Civil Engineers.—Mr. J. H. Greathead on "The Railway Station: Subaqueous Tunneling by Shield and Compressed Air." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—E. H. Robinson on "Sewerage and Sewage Disposal." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Lecture by Mr. J. Fitzgerald, M.A., F.R.S., on "The Sanitary Engineer." 8 p.m.

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teleopic or bending motion, hard composition rings cast on to the spigot end of each pipe and at the inner end of the socket, are provided with cup and ball surfaces, between which, an elastic, or viscous, or compressible coating is placed.

22,001.—FIREPROOF BUILDINGS: *W. Youlten*.—Walls or floors of buildings are constructed of tubes or solid blocks of polygonal outline in cross section placed alternately in juxtaposition to other tubes or blocks having corresponding re-entrant angles to fit the exterior angles of the polygons of the neighbouring blocks or tubes.

22,077.—WINDS: *W. Virel*.—Relates to devices for enabling window-sash frames to be swivelled within apartments. A U channel or groove is formed in one side of each sliding sash-frame, with a similar shaped metal bush sunk and secured in it. A plate is secured to the fixed frame, and formed with a scroll-shaped head which fits round the bush in the groove above-mentioned, and, in conjunction with the same, forms a kind of hinge, the parts of which allow the sash to have a vertical sliding motion, but are prevented from lateral motion by a plate screwed to the sliding sash. During the swivelling operations the sash-cribs are detached by hand and placed in grooves in a plate screwed to the fixed stile. Other modified arrangements are mentioned.

22,083.—WATER CLOSURES: *E. Chetlain*.—A closet which, besides being much lower in the seat than usual, is narrower at the front, and has an upwardly projecting part in front of the basin so that the user is obliged to take up a more or less squatting position outside the basin.

7,195.—TILES: *A. J. Dwyer*.—A burnt clay or cement tile for supporting concrete between iron or steel joists. The tiles are provided with one or more stiffening webs or ribs with side gussets upon the upper surface, or instead of these gussets, a continuous covered side may be substituted. Grooves are formed on the ceiling surface of the tiles to form a key for plaster.

10,350.—SILVER RULES: *T. Norris*.—Relates to such slide-rules as are composed of two or more concentrically-arranged discs pivoted together. To provide a simple marker or runner by which the scales can be easily read, and to enable the upper scale to be graduated independently of the lower one. (1) A plano-convex lens, which magnifies transversely, is mounted on the marker; (2) the lower disc is provided with one or more elongated openings to permit of the upper or marker disc to be graduated between the thumb and finger and turned independently, so that both discs may be manipulated by the fingers of one hand.

14,275.—GLUE: *E. Schmalz and another*.—Making glue by the addition of glycerine to the glue or size that has been mixed with a liquefying agent (such as sal ammoniac) with the object of preventing the glue or size from cracking when dry.

16,410.—SAWS: *C. Douglas*.—Refers chiefly to circular saws, the teeth of which are so formed that the back or outer edges have a clearance of less than 5 deg. angle from the line of cut. Ribs are formed on the sides of the teeth, and extend from the cutting-points to the heels, being most prominent at the point, and forming an angle of less than 1 deg. with the face of the saw-blade.

NEW APPLICATIONS FOR PATENTS.

OCTOBER 28.—20,352, W. Lord, Paving and other Blocks, Slabs, &c., 20,356, T. Atkins, Waste Water-closets.

20,359, J. Johnson, Water Flushing Cisterns.—20,310, C. Fisher, Frame Bevel and Clamp.

OCTOBER 29.—20,372, M. Aspinall, Closing Tray Arrangement to Ventilating Sewer Manhole Covers.

23,331, D. Keith, Window Sash Frames.—20,367, G. Allen, Rings for Flues for Bricks, Tiles, Pottery, &c.—20,395, E. Nicholson, Mouldings for Picture-frames.—20,399, E. C. Robertson, Window Fastener.—20,444, J. Mitchell, Valve or Flap for Sewer-gas Interceptors.

OCTOBER 30.—20,487, R. Cloughington and others, Syphon Discharge Cisterns for Flushing Purposes.—20,535, J. Gabriel, Drain-pipes.—20,517, C. Biggs, T-squares.

OCTOBER 31.—20,540, H. Vaughan, Continuous Burning Kilns for Burning Bricks, Tiles, Pottery, &c.—20,551, J. Lucas, Sliding and Swivelling Doors and Partitions.

20,589, R. Whymann, Wall or Ceiling Tiles.—20,592, E. Carter, Picture-frame Cramps.

NOVEMBER 1.—20,613, D. Arthur and others, Ventilation of Drains and Sewers.—20,514, W. Bancroft and G. Priestley, Brick and Tile-making Machinery.—20,672, T. Barrett, Taps.—20,687, S. Williams, Kilns or Ovens for Burning Lime, Cement, &c.

NOVEMBER 2.—20,721, J. Edwards and P. Pepin, Door-silencer, Draught-excluder, or weather-strip combined, for Doors, Casements, Shutters, &c.—20,740, J. W. Wolfeld, Waterproof Roofing-paper for Houses, &c.—20,744, W. Thompson, Water-closets, &c.—20,770, W. Busche, Brick-burning Kilns, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

18,310, H. M. Moore, Valves of Flushing cisterns, &c.—18,381, A. Hindley, Concrete Floors, &c.—18,438, T. Clark, Flushing cisterns for Water-closets.—18,449, J. Dougan and J. McMillan, Damp-proof Courses.—18,450, J. Dougan and J. McMillan, Concrete floors.—18,779, H. Roberts, Flushing cisterns.—19,457, E. Wendlich, Ventilating and smoke-preventing apparatus.—19,553, E. Smith, Water-saves and Frames.—19,703, C. Cross, Household Water-supply System.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

24,757, J. Green and others, Ventilators.—54, G. Chisholm, jun., Sanitary Pipes.—53, A. Boulton, Joints for Plankings.—297, H. H. E. E. Circular Saws.—14,664, E. Bernard, Connections for Earthenware Water-closets, &c.—17,441, H. Maass and P. Clausen, Removing Mists or Vapour from Shop Windows.—18,113, G. Coxhead, Glazing Horizontal Buildings, &c.—18,247, E. V. and F. Cousins, Traps or Interceptors for Drains.—18,399, J. Harnon, Access to and Ventilation of Drains to reduce Sockets for Soil and other Pipes.

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24,757, J. Green and others, Ventilators.—54, G. Chisholm, jun., Sanitary Pipes.—53, A. Boulton, Joints for Plankings.—

CORK.—Accepted for the erection of hospital, Western-road, Mr. J. F. McMillen, architect, 35, South Mall, Cork. Quantities by Mr. Richard Evans, Blackrock. Cork.—Richard W. Johnson, Marina, Cork. £5,747 Six tenders.

EASTLEIGH (Hants).—For the erection of new Baptist church, Messrs. Lawson & Donkin, architects and surveyors, Yalverton Chambers, Bourne-mouth. Quantities supplied by architects.—

	Chapel.	School.	Total.
W. Peary	889 10	930 0	1,819 0
Trehearne	863 6 11	930 1 11	1,793 8 10
W. J. A. Cluichem	895 0	105 0	1,000 0
Hart & Vick	861 0	109 10	1,000 10 0
P. Elcock	895 0	235 0	1,047 0 0
Wickham	822 0	215 0	1,037 0 0
C. Hunt	791 10	189 12 2	981 11 0
Rivland, Southampton	711 0	185 0	896 0 0

 * Accepted.

EGREMONT (Cheshire).—Accepted for the execution of sewerage works, New Brighton, for the Wallasey Urban District Council. Mr. A. Salmon, C.E., Public Offices, Egremont.—J. McCabe & Co., Ormskirk, Liverpool. £2,729 0 0

HAMPSTEAD MARSHALL (Berks).—For taking down and rebuilding the Schools, for the Trustees. Mr. James H. Money, architect, The Broadway, Newbury.—

E. C. James	£289 0	James Mason	£128 17 0
Geo. Elms	330 10	Pope & Co., East Woodhay	313

 * Accepted.

HINCKLEY (Leics).—For the execution of drainage works, &c., for the Urban District Council. Mr. W. T. Howe, Surveyor, Council Offices, Castle street, Hinckley.—

C. Haywood	£195 0	D. H. Porter	£128 17 0
John Holme	577 8	Ally Jewell, Market	125 0 0
Baker & Bailey	515 3	Harbrough	275 0 0

 * Accepted.
 [Surveyor's estimate, £391 15 5d.]

LONDON.—For the erection of eight houses, Harrow. Mr. Basil Slade, architect, 3, Grosvenor street, W., for the detached houses, and Mr. Solomon Ford, 3, Queen street, Chesham, for the semi-detached houses.—

	Detached.	Semi detached.
Wilkinson & Son	£4,000	£4,600
Elkington & Co.	3,839	4,600
Nottingham & Co.	4,311	4,455
Sumner & Co.	4,700	4,441
W. Fortescue	4,700	4,441
F. J. Chinchin	5,000	5,000
J. Denton	4,000	4,000
J. White	2,700	2,700
J. Street	2,000	2,000
Reach Bros.	2,000	2,000

 * Received too late, but opened 15th inst.

LONDON.—For the erection of a new music hall and choir vestry at Nunhead, for the Trustees of the Cattermole College Mission. Messrs. C. & A. N. Innes, architects, 27, Queen street, E.C. Quantities by Mr. G. Silvester.

	Mission Hall and Vestry.	Mission Hall only.
Downs	£289	£289
Marsland	845	775
P. Hart	710	710
Hart Bros.	710	713
William Bros.	710	645
Richardson	710	625

LONDON.—Accepted for the erection of six dwelling-houses, Duckett street, Stepney. Mr. Henry Roberts, architect.—W. T. Ellis, jun. £1,800 [No competition.]

LONDON.—Accepted for laying new cutters, and making and fixing sky-lights to foundry-roof, Holborn Viaduct, E.C.—George Barker. £110

LONDON.—For providing an additional room at the lodge in Finsbury Park, examining the drainage, and for works of repair and painting at the building, for the London County Council. Mr. Thomas Blackitt, Architect.—

A. Wallis	£132 0	W. Wells	£28 0 0
P. Britton	273 0	W. Wilkin	260 15 0
P. Hart	270 10	W. Pancy	210 0 0
T. Lathorne & Co.	246 0	W. Thorne	212 5 0
K. Harding & Son	243 0	G. E. Jeffries	251 12 0

LONDON.—For the supply and erection of three centrifugal pumps at the Heathwall pumping station, for the London County Council.—

R. Warner & Co.	£3,330	J. Blakeborough & Sons	5,555
Comes, Martin, & Co.	2,770	Gwynne & Co.	2,220
Drysdale & Co.	2,680	J. Cochran	2,220
Tangies Ltd.	2,695	W. Beaumont (Irregular)	1,995
Entwistle & Glass, Ltd.	2,520	W. R. Kenshaw & Co.	1,830

PORTMADOC (Wales).—For repairs and improvements to main road footpaths, for the Ynyscynharu Urban District Council. Messrs. T. Roberts & Son, C.E., Portmadoc.—David M. Roberts. £139
 William Hughes, Chapel street, Portmadoc. 120
 * Accepted.

NEATH.—For the erection of a block of almshouses and caretaker's residence, boundary-walls, and fencing, for Mrs. Llewellyn, by Mr. J. W. Rogers, 14, High street, Cardiff. Quantities by Mr. J. W. Rogers.—

Knox & Wells	£5,500 0	Cludge & Bloxham	£3,507 0 0
D. Jenkins	4,075 0	G. H. Wilkins	3,574 0 0
H. Wilcock & Son	4,017 10	D. Ross	3,798 0 0
T. Davies	4,000 12	E. Thomas	3,792 0 0
S. Slepston & Son	4,515 0	W. Lissaman, jun.	3,790 0 0
H. David & Son	4,320 0	Chipping Campden	3,670 0 0
T. Watkins & Co.	4,320 0	I. D. Williams	3,490 0 0
D. C. Jones & Co.	4,394 0	E. G. Ford	3,200 0 0

 * Accepted.

NOTTINGHAM.—For the erection of factory premises, Forester street and Rutland lane, for Messrs. I. F. & G. H. Perry, Mr. Lawrence Bright, architect, 9, St. Peter's Church-walk, Nottingham. Quantities by the architect.—

Geo. Carlton	£12,535	John Cooper	£11,685
John Greenwood	19,355	Thomas Culbert	11,400
Henry Vickers	12,664	John Oscoff	11,338
Scott & Son	12,085	Hudson & Son	11,129
A. G. Bell	12,002	Frederick Evans	10,695
Edward Woodward	11,745	I. H. Vickers	10,755
John Hutchinson	11,710	Thos. Baslow, Crocks	10,755
Geel & Son	11,700	street, Nottingham	10,333

 * Accepted.

PORTMADOC.—For the erection of chapel, school, vestry, &c., High street. Mr. T. Talleson Rees, architect, Birkenhead.—

Evan Humphreys	£2,711 0	Evan Jones	£2,610 0
D. M. Williams	2,129 0	John Shaw	1,939 0

 W. H. Biekeley & Co., £3,667 10 * Accepted.

READING (Berks).—For the erection of a parish room, reading room, &c., Woolhampton, near Midgham, for Miss Blyth. Mr. James Newman, architect, Sandown, Isle of Wight. Quantities by the architect.—

G. S. Lewis	£1,324 0	H. Hoskins	£1,978 0 0
G. Broiler	1,513 10	W. Hancock	1,250 0 0
W. Stokes	1,327 10	J. Johnson	1,249 13 6
G. Simmonds	1,313 0	H. Margetts	1,195 0 0
G. Wernham	1,258 0	G. Elms, Henley	1,195 0 0
T. James	1,286 0	Newbury	1,158 0 0

 * Accepted.

SOUTHWOLD.—Accepted for new drainage to the "Red Lion," "White Horse," and "Brickmakers' Arms" inns, for Messrs. Adams & Co., Southwold. Mr. T. E. Key, architect, 5, Bloomsbury square, W.C.—James Thompson, Southwold. £119 13 6

SOUTHWOLD.—Accepted for erecting a new house for Mr. H. J. Denney. Mr. T. E. Key, architect, 5, Bloomsbury square, W.C.—James Thompson, Southwold. £254

TO CORRESPONDENTS.

J. W. B. (famous) must be stated.
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 We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.
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J. J. ETRIDGE, Jr.

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House at Sutton Coldfield.—Mr. Ernest Newton, Architect Two Double-Page Photo-Lithos.

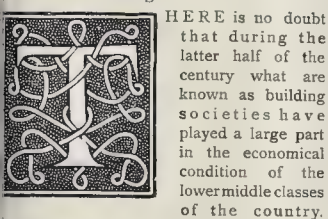
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Building Societies.



HERE is no doubt that during the latter half of the century what are known as building societies have played a large part in the economical condition of the lower middle classes of the country. They have been regarded by thousands of hard-working men and women as the best, often the sole, means of accumulating some savings, and in other cases the best, and again the sole, means of becoming the owners of the houses in which they live. The advantages of building societies however have, we think, been somewhat over-rated, and it is rather curious that such enormous importance should have been attributed to them by small investors. This very importance has often been the cause of loss, since a kind of idea has grown up that as soon as money was deposited in a building society it was quite safe. It is a matter of common knowledge that scores of people have been ruined by this implicit and unreasonable faith. Although, however, a possibly greater ruin is now exercised by investors since some of the disclosures of recent years, the king for this class of investments by certain persons does not at all diminish. It may, therefore, be desirable to take advantage of the publication of the third edition of Mr. Wurtzburg's standard work on the Law of Building Societies to point out some of the most noticeable features in regard to the growth of case law and legislation in connexion with them.

Building societies are of two definite kinds, namely, terminating and permanent: the former were more in favour at the beginning of the movement than they are at present, and consequently the importance of the permanent societies as a whole is continually on the increase. Another cardinal distinction also is that between unincorporated and incorporated societies. The former were created under the Building Societies Act of 1836, the first statute to establish these bodies. This old statute was repealed by the Building Societies Act of

1874, with a proviso that this repeal should not affect any society in existence in 1874 until it obtained a certificate of incorporation. The result, of course, is that unincorporated societies are gradually growing fewer in number. This number will shortly be still further diminished, since by the Act of 1894 the Act of 1836 shall be repealed as to all societies certified after 1836 not later than August, 1896. It is difficult to understand why the Legislature could not once for all have put an end to all differences between the two classes of societies, and make but one class, namely, incorporated societies. It is equally astonishing that opportunity was not taken of the legislation of 1894 to pass a single consolidating and amending Act. At present incorporated societies are regulated by five statutes, extending from 1874 to 1894. Some sections of the earlier statutes have been repealed, with the result that the Acts, as they stand in the Statute Book, are not a plain and uniform code. Nothing is more desirable in regard to such institutions as these than that the statute law which regulates them should be in a single Act, which can be easily read and understood by ordinary individuals. To have the Acts as they now are is neither more nor less than a piece of legislative laziness, since it would be perfectly simple and easy to enact one plain code of law on this subject.

As has been already mentioned, the first Act of Parliament on this subject is that of 1836. The cardinal feature of every succeeding Act has been an increase in the stringency of the regulations for the management of building societies, with a view to the better protection of the money of those who invest in them. This tendency is by no means a favourable commentary on what may be called the voluntary system of management, which has over and over again been found to be too lax. Advances on the security of house property are those in regard to which the greatest possible care is required, so that there may be a large margin in case of a depreciation of the property. But there is no sort of transactions in regard to which greater mistakes have been made. Thus it is obvious that this greater stringency was necessary, and it is only to be regretted that the loss of the savings of many thrifty people, who have relied implicitly on the judgment of those put in charge of building societies, should have been necessary to procure amendment in the law. A striking example of the increased strictness of management and of the lessening of

the freedom of judgment on the part of those in authority, is to be found in regard to second mortgages. "In many societies," writes Mr. Wurtzburg, "advances on second mortgage are expressly forbidden by the rules, and this very wholesome provision has now been adopted by the Legislature and made universal, Section 13 of the Act of 1894 providing that an incorporated society shall not advance money on the security of any freehold, copyhold, or leasehold estate, which is subject to a prior mortgage, unless the prior mortgage is in favour of the society making the advance." Singularly enough, however, the provision does not extend to societies in Scotland or Ireland, which in 1894 were allowed by their rules to advance money on second mortgages. The shrewdness of Scotchmen is proverbial, but we can hardly suppose that that was the reason which induced the legislature to limit the extent of the provision. This, again, is a curious instance of the half-hearted way in which social reforms, even of a small kind, are frequently carried out.

Again, also, the provisions of Section 40 of the Act of 1874, in regard to the annual statement, have been amplified, especially in regard to mortgages, by the second Section of the Act of 1894. It is sufficient to refer our readers to the statutes for the purpose of a detailed comparison, and to say here that the object of the change is to give as much publicity in regard to these securities as possible, so that shareholders may be able to form some kind of judgment on their value. While we are referring to instances in which the Legislature has put restrictions on the conduct of those in charge of building societies, we may call attention to the very salutary provisions of the twenty-third Section of the Act of 1894, by which "no director, secretary, surveyor, solicitor, or other officer of a society shall, in addition to the remuneration" he may receive from the society, "receive from any other person any gift, bonus, commission, or benefit." If he does he is liable to a heavy penalty. Righteous as the provision is, it may be doubted whether it will have much effect where an officer is so forgetful of his duty as to take commissions from persons with whom he is in negotiation. It is to the interest of all parties to such transactions to keep silence about them, and the difficulty of discovering them is great. This is an instance of what, while it is obvious, is not sufficiently borne in mind by those interested in building societies—

"The Law Relating to Building Societies." By E. A. Wurtzburg, Barrister. London: Stevens & Sons, Ltd.

namely, that the best check on any form of mismanagement is careful supervision of the work of the society by those whose savings are placed in it. No doubt a large proportion of investors are not men of business, but many others are. Nothing is more remarkable than the fact that such persons take so little trouble to look after their affairs in regard to building societies, and rely, with a childish confidence, on paid officials and directors.

While touching on officials, it is important to bear in mind that it has been judicially decided that a surveyor who is employed by a society to value property is bound to use reasonable care and skill in the task. An instance of this principle is to be found in a comparatively recent case which is referred to by Mr. Wurtzburg, in which a society advanced 350*l.* on mortgage on the faith of a report negligently made by their surveyor that the property was worth 464*l.*, whereas its real value was only 216*l.* The result was that the society recovered the difference from the surveyor. We confess that this case appears also to be an instance of the want of judgment which has so often been shown by directors of building societies. A house which is valued at 464*l.* is not in our opinion sufficiently good security for a mortgage of 350*l.*

In conclusion we can only say as emphatically as possible that, valuable as are the alterations which have gradually taken place in the law of building societies by means of legislation and of judicial decisions, losses must from time to time occur, unless careful supervision is exercised by officials and by investors, and that a prudent man will never assume that by investing in a building society he is putting away his savings in safety. He must give to the work of the society some personal attention.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND

By PROFESSOR BALDWIN BROWN.

V.—The Tradition of Rome.

BEDE tells us that in the Northumbria of his day there still remained the "cities, towers, bridges, and paved roads" of the Romans, while he knows also of "towers at intervals on the shore of the ocean to the south overlooking the sea," which we now call Reculver, Richborough, Lymne, Pevensey, and Porchester. Monuments of Roman handiwork are still visible on various sites in some score of English counties. "Certes," so runs the phrase in the English "Camden," "they are works of exceeding great admiration and sumptuous magnificence," while to the contemporaries of Bede such remains must have been far more in evidence than could be the case in the days of Camden or in our own. It becomes needful, therefore, to inquire as to the extent to which Roman influence is apparent in the form and technique of pre-Conquest churches.

In respect of general form, attention has previously been called to the non-Roman look of so many narrow, square-ended, Saxon churches, and this subject will be returned to on a subsequent occasion. The present paper deals only with some points connected with material, technique, and the design of details.

An examination of pre-Conquest buildings from the point of view of our knowledge of Roman technique leads to the following results. We may distinguish between brickwork and masonry. In the case of the former, we have as our starting-point St. Pancras at Canterbury, for the remains at Silchester are too slight to afford evidence of technique.* Whether St. Pancras is Romano-British or Early Saxon, it shows

excellent and regular Roman brickwork, as may be seen from the subjoined comparison of a portion of the north wall of its porch

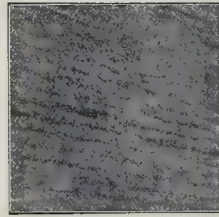


Fig. 26.—Brickwork from West Porch of St. Pancras, Canterbury.

with some brick facing from the Baths of Caracalla at Rome (figs. 26 and 27). Apart from St. Pancras, and, as we should probably be right to add, Reculver, the Saxon use of Roman brick is of a somewhat hap-

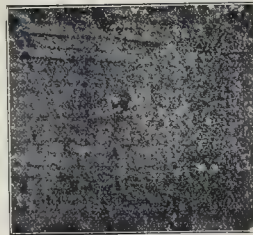


Fig. 27.—Brickwork from Baths of Caracalla, Rome.

hazard character. Employed occasionally in walling, it is most often used for turning door and window arches, and occurs in this connexion where the walling is of ordinary Saxon stonework. There are examples in the tower doorway at Brixworth (fig. 28)

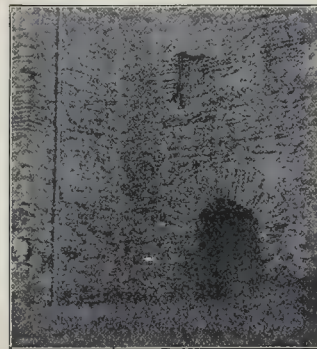


Fig. 28.—Brixworth.

(note also bricks irregularly used in the walling), in nave windows at St. Nicholas, Leicester, and Arlington, Sussex, and a tower window at Swanscombe, Kent. One of the two enigmatical arched openings at the east end of the nave at Britford, near Salisbury, is turned in the same material. Although, however, the Saxons found this use of Roman brick convenient, they do not seem to have taken much trouble either with the fabrication or use of the material. Whether or not they made these bricks themselves is an open question. Their handling of stonework is a more interesting matter.

It is often assumed that Saxon masonry must, almost necessarily, be a continuation of Roman. The Teutonic invaders, it is pointed out, had been only accustomed to

build in wood, and could not bring with them any tradition of work in stone. The survival of Roman monuments as attested by Bede, as well as the often-quoted narratives about the introduction of foreign artificers trained in Roman technique by those typical Early Saxon builders, Wilfrid and Benedict Biscop, appear to indicate the source from which Saxon forms must have been derived, and as the buildings erected by the last-named were "in the Roman manner," it has been assumed that this same manner became stamped on all the stone structures of the country. It has been stated above (p. 252, ante), that the "Roman manner" is not very apparent in the supposed work of Benedict at Monkwearmouth, and it must be said further that, in comparing Roman stonework generally with Saxon, we find the points of resemblance more than balanced by pronounced differences. These differences are sometimes fundamental, but they are almost equally marked when the particular feature in question may, in its ultimate origin, be Roman. In certain respects the technique of the Saxons is distinctly non-Roman, while on sundry features borrowed at first from Rome they put a native stamp that renders them essentially Old English and not Classical. We may test the truth of this in connexion, first, with the fabric of walls, and then with such features as arched openings, stone quoins, and column shafts.

What is the most prominent feature about Roman masonry? Surely it is the scientific disposition of the materials into core and facing. In some Romanised regions of the Continent, such as North-Western France, this method of construction, established by the legionaries, lasted on, without any break of tradition, throughout the early Romanesque period. Fig. 29 shows a portion of the masonry of a country church near Tours, dating probably from the tenth century, that exhibits walls constructed of rubble with a facing on each side composed of small square stones of Roman type, and this same "petit appareil" occurs in many other early churches of the Loire valley, as well as in the better-known "Basse Œuvre" at Beauvais. In other examples in this region, such as some Norman village churches of the eleventh century in the vicinity of Caen, the Roman technique of "herring-bone" facing is perpetuated. It is only exceptionally that we find in the early Romanesque period the sort of irregular, unsystematic stonework, which is, on the other hand, the rule in the pre-Conquest monuments of our own country.

The present writer is at a disadvantage in dealing with a matter like the construction of walls, as he does not enjoy the opportunities offered from time to time to the professional architect of pulling old buildings about or



Fig. 29.—Ruined Wall at Sockburn-on-Tees.

repairing them. It is only, therefore, under correction that he puts forward the statement that Saxon walls are not constructed on the Classical "core-and-facing" system, and are accordingly fundamentally different in principle from Roman. In the North of England the walls of Saxon stone churches are comparatively thin, and apparently of

* By an oversight, on the sheet of plans given on p. 216, ante, the apex at Silchester was marked as if it turned to the east. It really points westward, and in this the building is exceptional among our early churches. This does not, of course, militate against its being a Christian church, and an early one.



Fig. 31.—Doorway in North Transept, Stow.

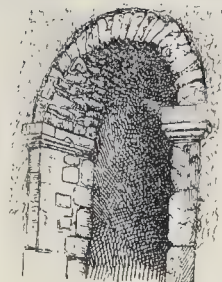


Fig. 32.—Tower Arch at Warden, Northumberland.

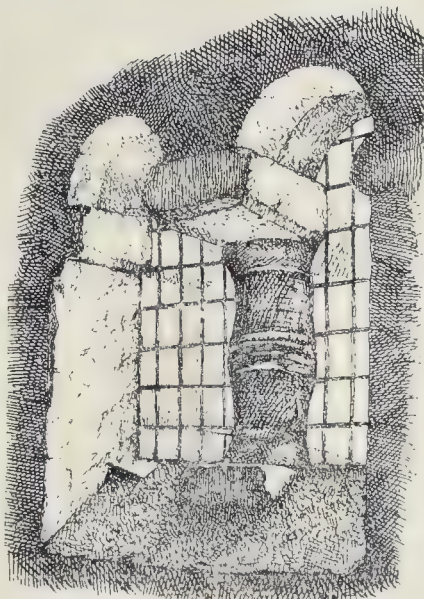


Fig. 33.—Windows in Tower, Barton-on-Humber.



Fig. 34.—Quoin at Wittering, Northants.



Fig. 35.—Corner of North Transept, St. Mary, Dover Castle.

same irregular texture of masonry throughout. Fig. 30 exhibits the top of a wall as it appears in its ruined state. Sockburn-on-Tees, where Mr. Hodges has identified a Saxon chapel. The stones form the faces nearly meet in the middle, and the whole is rudely though idly put together of blocks very imperfectly squared. In the south the walls of churches are often more substantial, the material is not so good. Those of the tower of Clapham Church, near Bedford, are about four feet thick at the base. The construction is, however, equally unscientific, and the facing never of Roman character. Brixworth (fig. 28) is perhaps an extreme instance of irregularity, just as the tower of the church at Wittering, Northants, is an exceptional instance of the regularity of its stones. The best Saxon work is intermediate between the two. Only in one instance known to the writer, that of the south wall of the present church at Jarrow-on-Tyne, the sister-house of Wearmouth, does the surface of a Saxon wall incline one to exclaim, Here is masonry of Roman type! Considering how Roman the *petit appareil* in Northern France this is somewhat remarkable.

To this it may be replied that the pre-Roman walls in question were meant to be plastered, and that their structure and facing were in consequence of little moment. These remarks, however, apply to Roman work, and to the Romanising work on the Continent, in which structure and facing were alike systematic. The Romans, as Professor Middleton has shown ("Ancient Rome," ch. 2), took as much pains with wall facings which they meant to cover with plaster or incrustations, as if they were to be left exposed. So, the "primitive Romanesque" (Chanceau, fig. 29), was intended to have plaster, and actually remains on the other side of the arch. The intention of plastering does seem to have made much difference in the building in the "Roman manner," and it is not to be taken account of in the present argument.

The use of plaster in itself is a further point. Lime plastering, like arch construction, is a contribution to architectural technique that Rome herself inherited from other peoples, and passed on to the younger

lands of the West. The Saxons seem to have employed this technique, as they employed the arch, from the date of the earliest of their monuments that have come down to us, and to this extent they certainly built more Roman. The use of the arch in Saxon churches is, however, significant of the real position of their builders. Save in exceptional cases, it does not lead on to the employment of the vault. The apses of Saxon churches possessing these features were doubtless vaulted, but it is only in the case of Wing (Bucks) and Worth (Sussex), both apparently late examples, that the actual vaulting has survived. The other instances

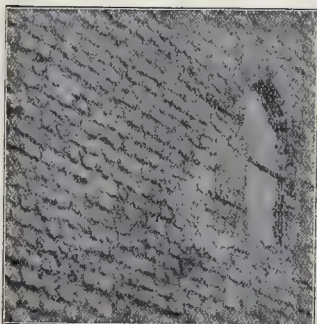


Fig. 29.—"Petit Appareil," from Chateau-sur-Choisille, near Tours.

of Saxon vaulting are in the crypts of Wilfrid (at Hexham and Ripon) and the porch at Monkwearmouth. The former structures are of great importance, as their date is unquestioned, but it has not been necessary in these papers to describe them. In the above-ground structures with which we are occupied, the barrel vault that covers the Monkwearmouth porch is a unique feature, to which no parallel in Saxon work is known to the writer. To return to the arches: the best examples among those that are probably of early date are the ones at Escomb and

Corbridge, and in the above-named porch; and it is very possible that these are not merely "in the Roman manner," but actually Roman structures taken down from Classical buildings and re-erected where they are at present found. Besides these, there are other fairly well constructed Saxon arches of wide span, but these occur either beneath towers or at the crossings of cruciform churches, in both of which cases a comparatively late date must be assumed, and we may account for the good work by the general advance in European architecture which marks the eleventh century. Had the Saxons learned the technique of arch-construction by direct tradition from the Romans, as it was learned by Continental artificers, they could not have made the curious blunders in the cutting and fixing of voussoirs which we find from time to time, as for example in the north transept doorway at Stow (fig. 31). The windows of "primitive" churches in Northern France never exhibit these aberrations, but are arched with wedge-shaped stones with radiating joints. It is partly no doubt through their ignorance of this elementary branch of stereotomy, that the Saxons cut arch-heads out of a single stone, use Roman bricks where they could obtain them, and resort at times to the rubble construction shown in the tower-arch at Warden, Northumberland, given in fig. 32.

The imposts of this tower-arch at Warden introduce us to a new feature—the pre-Conquest moulding. The imposts of the tower, chancel, and door-arches of Saxon churches are either (1) square in section; (2) chamfered beneath; or (3) diversified with mouldings of greater or less elaboration. In some cases these impost stones, like the voussoirs, seem to be actually Roman, while in many instances they are moulded into forms closely resembling those found on Roman altars and tombstones. This similarity may be made the ground of an argument for the early date of those buildings in which the features in question appear. Thus, the arch between nave and tower at St. Mary's, Dover Castle, has imposts as Roman-looking as those at Warden. The grounds on which a later origin is ascribed to this and other cruciform churches, are,

however, so weighty, that it will be well to treat the features that occur in them as rather Romanesque than Roman, and to reserve consideration of them to a later occasion.

Features more elaborate than the moulded impostes are the well-known baluster shafts that are used, most commonly, to divide the openings of double or triple windows in the belfry stages of towers, and that also occur elsewhere. These are doubtless, in their ultimate origin, Roman, but their form and their use is so far peculiar to this country that we may claim them as a characteristic national feature. That the Romans turned small moulded stone shafts in the lathe is certain. Though there is no passage in Classical literature that describes the technique, we can see the evidence of it in the shafts themselves, for examples with the marks of the turning-tool may be seen, *e.g.*, in the Museums of Leicester and Rouen, and, *in situ*, behind a house in the Watergate, Chester. A similar stone shaft of quite a Classical form occurs in the belfry opening on the north of the tower at Wickham Church, Berkshire, but the more general type has no capital or base, but a series of projections and recesses, either distributed, as at Monkwearmouth (fig. 21, p. 251 *ante*), along the length of a straight-sided shaft, or encircling a shaft of bulging shape as at Barton-on-Humber (fig. 33). The former type, abundantly represented by the Wear and Tyne, may be held to be the earlier; the latter are numerous in pre-Conquest towers, and occur in the nave-openings at Brixworth and Worth.

The method of use of Saxon balusters as "mid-wall" shafts is too well known to need description. The drawing, fig. 33, gives a characteristic example. Continental parallels to these features are hard to find, but a baluster similar in shape and use to our own is to be seen in the old church of St. Pierre, within the grounds of the famous Abbey of Jumièges, the work of William Longsword in the tenth century, and slender turned shafts, somewhat like the well-known ones at St. Albans, occur on the façade of the early church of St. Mexme at Chinon, by the Loire.

Stone quoins and plaster strips are the last features which claim attention here. The latter are of comparatively rare appearance, and may in the meantime be passed over. The former occur throughout the style, of which they are one of the most characteristic marks. Now it is a noteworthy fact that neither the Romans nor the Normans laid any great stress on the treatment of corners in stonework, and were satisfied with constructing them carefully of well-chosen ordinary wall-stones, whereas the Saxons nearly always emphasised these parts of their buildings by the use of special materials and distinct methods of bonding. As will be seen in the sequel, there is no reason for claiming a native British or Celtic origin for the system, and it seems to have been of genuine Saxon growth—a contribution on the part of the Old English builders to the stock of forms from which the later Mediæval styles were evolved. Many suggestions have been made as to the origin and affinities of this characteristic feature, but there is no space for their discussion. The following summary is all that can be offered.

The Saxon quoins in question are of two kinds, and are composed either of very large and massive stones that lend a ponderous strength to the angles, or else of stones specially arranged according to the fashion known as "long-and-short" work. The big stones are in many cases of Roman cutting, though the Saxons themselves, at any rate in later times, knew how to chisel and saw them with commendable accuracy. The massive quoins formed of them are the finest things in Saxon architecture, and are full of character as well as effective from the point of view of construction. The "long-and-short" work should really be called "upright and flat," for the "short" stone is,

or should be, a flat slab laid on the upright and pillar-like block and bonding to the full extent of its surface into the wall. The "short" look is due to the appearance of the flat slab, when, with the wall above and below it, it is covered with plaster up to the line of the upright stones, with the sides of which it then seems co'terminous. Both the flat and the upright stones are cut back to receive the plastering, to which they form a vertical border. Such an arrangement can be seen in fig. 34, which shows a well-marked long-and-short quoin at Wittering, Northants, where the upright stones are nearly 4 ft. in height.

The history of the feature cannot be written till the chronology of Saxon churches is better fixed than at present. Taking the cruciform and towered churches as Late, and Monkwearmouth and Escomb as Early, we note that while big-stone quoins are used at every period, long-and-short quoins appear to be of later development. An earlier feature out of which they may have been evolved is the framing of door-jambs, which consists of flat slabs superimposed on upright. If it be true that the western door of the porch at Monkwearmouth (fig. 19, p. 251 *ante*), and the chancel-arch at Escomb are really Roman structures reused—a technical question on which the present writer hesitates to pronounce an opinion—then this method of laying stones is Classical, though the transference of the system to quoins may be due to the Saxon masons. Door-jambs of the same construction certainly occur in Byzantine building. The use of "long and short" in a doorway and of big-stones in a neighbouring quoin may be studied at the north-west angle of the north transept of St. Mary's, Dover Castle (fig. 35).

A full discussion of these interesting features of our Early architecture would only be possible on the basis of a complete statistical survey of the buildings where they occur or whence they are absent. Such a survey is still a *desideratum* for the future, and the present paper has merely treated the subject in the most general way, with a view of showing that Roman tradition is not nearly so potent in the structures of Saxon England as in the work of the corresponding period on the Continent. This fact would, indeed, follow naturally from the break of continuity in our early history, caused by the conquest of the country by invaders who, unlike the Goths and the Franks, were practically untouched by either Christianity or Roman civilisation. This, however, only increases the interest of the study of our Early monuments. The forms and the treatment they show must have had an origin and a history. If not Roman, they were either derived from some alien tradition or were developed independently by the Saxon builders themselves. The next two papers will deal with the question, How far the facts of pre-Conquest architecture may be explained by the traditions of British or Celtic stone building, or by the influence of the old-established technique of timber-work common to the peoples of the North.

NOTES.

ALL those who believe, as we do, that the metric system of weights and measures is the rational one, and that its general adoption in this and every country can only be a question of time, must have noted with interest the information and arguments brought forward by the members of the important deputation from the Chambers of Commerce to Mr. Balfour on Wednesday, and the weighty and statesmanlike reply of Mr. Balfour. The deputation made three proposals: that the metrical system of weights and measures should at once be legalised; that its use should be compulsory after two years; and that every effort should be made to teach it in elementary schools. With the first and third proposition Mr. Balfour is in entire agreement, and no rational person could, as it appears to us, take any other

view. In regard to the second proposition it seems equally certain that if compulsory legislation is to be resorted to, the period of two years is too short, and would lead to an immense amount of practical inconvenience and bewilderment among the less educated classes. Time must be given for the results of the education of the rising generation in the metric system to have its effect in preparing the way for the change. Mr. Balfour is disposed to leave the change to develop of itself, as he thinks it would if the legal restriction were abolished, and the gradual adoption of the system by large trading firms were left to have its natural effect. So we believe it would, but it would be a long business, and it would be certainly desirable that it should be settled as soon as possible to what system the young are to be educated. For this reason we believe that a fixed date for compulsory legislation on the subject would be a national benefit; only that two years is far too short a period. In this respect Mr. Balfour has done good service in checking the too rapid march advocated by those who do not represent the less-educated class of traders. But an announcement of a fixed date for the general adoption of the metric system would be a great advantage to the community, and would probably do more than anything else to hasten the change. Why not begin with the new century—a natural epoch for making a fresh start? That would leave a clear four years—double the time suggested by the Chambers of Commerce, and would probably commend itself to public opinion generally.

THE result of the competition for the Cairo Museum is in one sense more satisfactory than was expected at the time. We gave a review of the competition designs under date April 6 of this year, and mentioned that premiums had been awarded to four French architects among the competitors. The conditions of the competition were that the selected design was to become the absolute property of the Egyptian Government, to carry out as it pleased, under its own official Architectural Department. The technical members of the committee, however, recommended that the Egyptian Government should communicate with any one of the four premiated architects, and appoint him to carry out the work, and they have acted on this advice, and have put the work into the hands of M. Marcel Dourgnon. It seems only a pity that this course was not previously determined upon and announced, as it is believed that various English and German architects of note would have entered into the competition, but for the feeling that they did not care to sell a design to be carried out by the subordinate officials of a Department.

AT the annual meeting of the Egyptian Exploration Fund, Sir John Fowles, K.C.M.G., in the chair, a general description of the work carried out during the past year was given. It was stated that the excavations carried out at Deir-el-Bahari by Mr. Naville are now complete, and are reckoned by the promoters as an achievement which is on a level with that carried out at Medinet-Habou, and even Karnak. The artists of the Fund are to go out again this winter, to make copies of the sculptures of the famous expedition to Punt. In connexion with the scheme for the dam at Philæ, last year the terror of archaeologists, but now much less formidable, Captain Lyons is about to survey the island and its monuments, making a detailed plan of the whole site. Mr. D. S. Hogarth gave an interesting description of his excavations made at Alexandria during last winter, by which he had hoped to get some information about the Hellenised Jews who flocked into Egypt under the Ptolemies, and to have obtained some discoveries of works of art or of the ancient libraries of Alexandria. However, his excavations showed that whatever objects of art of the best period existed in Alexandria are either under water, in con-

sequence of a general subsidence of the land, have been extracted long ago; and he has come to the conclusion that no papyri are likely to be found in the city. This being the case, he has advised the Society not to proceed in these works, being of opinion that it is not in Alexandria that we must look for MSS, but higher up the Nile, in the alluvial villages, where papyri in large quantities are found in tombs and houses, and where Mr. Hogarth is sanguine that examples of early Christian literature—possibly a copy of the New Testament—may be more than likely to be discovered.

ROMANIA has made a handsome contribution to Roman archaeology in the lately folio edited by G. Toculesco,* which embodies the complete publication of the well-known monument of Trajan, on the river Danube. If the name of Mr. Toculesco is unfamiliar to English scholars, his cotutors, Drs. Otto Benndorf and George Hermann, are of European fame and are sufficient guarantee for the excellence and thoroughness of the work. The existence of the monument was practically unknown in 1837, when Frederick William III., at the request of Sultan Mahmud II., sent a commission of four Prussian officers to inaugurate certain military reforms in the district. They penetrated to the modern village of Adamklissi, and in reporting on Trajan's monument made mention of the dome-shaped structure 40 ft. by 100 ft. in size. They conjectured that the monument was a mausoleum, and noted that it had been despoiled of many architectural features, pillars, capitals, architrave, and sculptures which lay scattered about the neighbouring fields. Since then individual travellers have noted the monument in passing, and in 1890 Hermann and Benndorf undertook its complete exploration. All the loose architectural fragments as well as the sculptured metopes have been conveyed to the museum at Jassy. The present book is the result of these investigations, and it will be invaluable to the study of late Roman architecture and sculpture. The metopes, forty-nine in number, refer to Trajan's Dacian campaign, and are of very unequal merit. They are all published in phototype-plates, and form a set as valuable historically as from the point of view of art. These sculptures are described beyond the possibility of question by a dedicatory inscription, a great part of which is extant; the dedication is by Trajan self to "Marti uliori." The monument was of course a military trophy, not a mausoleum. The exact occasion of its erection, the significance of the sculptures, and every architectural detail, are fully discussed and illustrated in the text.

THE official report of the proceedings at the Russian Architectural Congress at Moscow (which has reached us somewhat late) shows us that this second gathering of Russian architects must have been a successful one, though we miss several well-known names on the list of members. The report explains that the gathering was the second one, the first having been held in 1889. There were about 350 present at the opening meeting, no less than sixty-five foreign bodies being represented. The Chair of the Moscow Society of Architects, Bikowski, presided. The work of the Congress was divided into four sections—architectural Art; II. Construction and Building Law; and a special exhibition opened in connexion with the congress. The exhibition included some important works, such as the new Cathedral at Jassy, and an interesting collection of drawings illustrating the temporary buildings erected for the last year's Nischni-Novgorod Exhibition. Numerous papers were read, and some animated discussions followed. The con-

gress, it appears, will lead either to the formation of a National Architectural League or the amalgamation of the various existing architectural societies.

OUR official contemporary, the *Centralblatt der Bauverwaltung*, gives a long description of the recent structural and decorative alterations at the Berlin Opera House. These alterations have been pending since 1889, when the new theatre regulations were introduced in Prussia; but instead of setting an example of speedy compliance with the code the Court officials practically opposed the very necessary improvement of the building. Whilst the alterations were most strictly enforced on the private theatres regardless of cost, the "Match-box" or "Mouse-trap" (under which names the structure was best known among firemen) was allowed to nightly assemble its large audiences; all manner of excuses were brought forward; and when the reconstruction was eventually decided on it was done so reluctantly and so slowly that an outsider, Herr Heim, had to be called in to supersede the officials. The alterations comprise the rebuilding of several staircases, a general rearrangement of the lobbies, and some alterations to the corridors; the auditorium, foyer, and vestibule have been remodelled and redecored, and a new system of central heating and ventilation introduced. The stage, with its appliances, has been thoroughly modernised, and the whole of the offices rendered more convenient. The heating arrangements perhaps caused most trouble, owing to the boilers and machinery having to be put up at some distance from the building and the ducts taken under an important roadway. The building is the property of the nation, and the Court is the lessee.

THE accident to the Eastbourne express, like the more recent and more serious affair at St. Neots, appears to have been attributable to some defect in the permanent way. Colonel Addison's Report upon the former occurrence has just been issued, but the cause of the accident still remains very much a matter of conjecture. The Board of Trade Inspector had, however, enough evidence before him to warrant the observation that "sufficient attention had not been paid to details" in connexion with the examination of the line at this particular spot. The regular and thorough inspection of every foot of the permanent way is of the first importance, and although the Report states that the defects observable in this case were not serious, it is clearly implied that they may have contributed to the derailment of the carriages. This was a sufficiently serious matter, and it is a matter for congratulation that so little harm resulted. That no great damage was done was due to the action of the automatic brakes on the rear portion of the train, and also to the reduced speed. Had the train been travelling at the same rate of speed as the East Coast Express, the "few loose keys" might have been responsible for a lamentable loss of life.

EVERY engineer and surveyor who has had much survey work to do has felt the need of some instrument for ascertaining horizontal distances, as the present method of measuring between two points by means of a chain is tedious, and is one which does not give accurate results when the surface of the ground is not level. Of course, many instruments have already been devised for this purpose, but the latest, namely, the "Terrameter," invented by Mr. J. Donnan, Assistant Engineer in the Public Works Department, India, seems to be the best suited for everyday work. This instrument is provided with an ordinary theodolite telescope, on one of the trunnions of which an arm is fastened, and arranged to move freely in the same plane as the telescope, so that the lower end of it will indicate, by means of a scale fixed on the body of the instrument,

the vertical angle traversed. In connexion with the instrument it is necessary to use a staff, upon which two large discs (2 ft. diameter) have been fixed at a vertical distance, say, of 10 ft. When the horizontal distance between two points is required, the "Terrameter" is set up over one of them, and the staff is held over the other. The operator then reads the space traversed by the bottom of the arm above alluded to when he sights first on the lower and afterwards on the upper of the discs, and with this information the distance between the two points can at once be ascertained by referring to a set of tables, calculated for the particular distance the discs of the staff are apart. For measurements less than 1,000 ft. from the instrument, a variation of 1 ft. can be easily detected on the scale, and as the "Terrameter" can also be used as a theodolite and level, it will no doubt be found of much service in the field.

AT the invitation of the Master and Wardens of the Worshipful Company of Carpenters, a large number of gentlemen interested in technical education, including Mr. F. C. Penrose, P.R.I.B.A., attended at the Trades' Training School, Great Titchfield-street, in order to inspect the workshops which have been inaugurated by the Carpenters' Company and six other City Companies. A short address was read by Professor Banister Fletcher (to whose exertions the establishment of the schools is mainly due), as Chairman of the Executive Committee of the school, in which he referred to the fact that the gradual abandonment of the apprenticeship system had rendered it imperative that the education of the craftsman should be fostered and extended by some such means as that provided by the Trades' Training School. Each workshop was then visited. In the Tylers' and Bricklayers' rubbed and other brickwork, from carefully-prepared geometrical drawings for difficult problems, was shown. In the masonry-shop, one of the most interesting to architects, the first prize has been awarded to a model, one-eighth full-size, of one bay of the cloisters of Gloucester Cathedral, executed in clunch stone; elliptical staircases, with winding stairs and raking arch, domes, and circular-headed tunnel-vaults were other samples, all demanding an absolute knowledge of descriptive geometry. In the carpentry and joinery schools some excellent work in roofs, joints, and floors were shown, and in the plumbing-shop successful demonstrations of the adaptability of lead to ornamental and sanitary work were exhibited. In the Plasterers', Painters', and Wheelwrights' shops the technique is good, and artistic design will no doubt be developed as the craftsmen proceed in the more advanced stages—a remark which is well justified by the work in the wood-carving classes. The Smiths' shop, which has only just been started, completes the list of all the building trades which are thus conveniently placed under one roof. In connexion with the instruction given in each trade, we are glad to see that the craftsmen are not treated as machines for the execution of designs, but that each goes through the whole routine, from drawing his work out to scale, detailing, cutting his working moulds, and lastly fixing his work up.

THE Annual Report of the Willesden District Surveyor, Mr. O. Claude Robson, is, as usual, an admirably drawn-up document, and touches on a great many points of interest in regard to local improvements in this important district. Among other things it is remarked that the public authorities ought to have greater powers of control over the water companies in regard to the breaking up of roads and the depth at which pipes are laid; some of the latter, when the great frost of last winter drew painful attention to the subject, being found to be laid at a depth of only one foot below the surface. The Report strongly recommends the periodical flushing of

* Das Monument von Adamklissi. Tropaeum unter Mitwirkung von Otto Benndorf und George Hermann. Herausgegeben von G. R. G. Toculesco. 1895. Halber.

all house-drains as efficiently as the sewers are flushed. Complaints as to obnoxious odours from ventilators "are mostly received during dry seasons when the house-drains receive nothing but the domestic sewage, and but little rainfall descends upon the roofs of the houses for flushing purposes. In such cases, when a complaint is received as to a particular ventilator, instructions are given for flushing to be administered to the house-drains in the neighbourhood, by means of a 2½-in. hose with a strong pressure of water from the mains. The result is that in nearly every case a blocked or foul syphon is discovered very close to the offending ventilator, the medium of blockage or fouling being very often a large collection of grease that should have been intercepted, and which when decomposed gives off one of the foulest odours that can be experienced. With the flushing of the house-drains and the removal of the blockage the complaints cease as to foulness of sewer, until possibly the syphon again becomes choked with solids." The River Brent still remains without improvement, the water above the Willesden Sewage Works being dammed up in the Welsh Harp reservoir during dry seasons, and suddenly discharged during periods of heavy rain by sluices, a process which destroys the bank and bed of the stream, and often causes serious flooding in the fields and roads. There are many other points of importance touched on, and those who live in or are interested in the neighbourhood of Willesden should procure the Surveyor's Report and read it.

WRITING to the *Times*, Mr. Ashbee, Chairman of the Committee for the Survey of the old Memorials of Greater London, directs attention to a proposed scheme whereby the Trinity House Corporation seek to dispose of their almshouses, with the extensive ground on which they stand, in Mile End-road. The older buildings, of red brick, and two stories high, range north and south along two sides of a spacious planted quadrangle, at the remoter end of which is the chapel, containing some stained glass removed from the old hall of the Trinity House at Deptford. Behind these are some later buildings, in yellow brick, with the statue, originally at Deptford, of Captain R. Marples, *obit* 1680. In the front court, which is open to the main road, is the statue, erected in 1745, of Captain Robert Sandes, an Elder Brother, who died in 1720, bequeathing to the foundation the reversion of an estate in Lincolnshire. On each of the two gable ends, towards the gates, is an ornamental tablet thus inscribed:—

THIS ALMSHOUSE wherein 28 decay'd Masters & Commanders of Ships or y^e widows of such are maintain'd was built by y^e Corp^o of TRINITY HOUSE An. 1695. The Ground was given by Capt^o HEAV MUDD or Rattcliff an Elder Brother, whose widow did also contribute.

The houses, rich in carvings, inscriptions, coat-arms, old lead work, cisterns, and the like, and carrying four interesting old models of ships, are very little changed from the appearance they present in S. Gribelin's print. Mr. Ashbee refers to the tradition that they were designed by Sir Christopher Wren, who, he says, was employed in surveying an estate in Stepney and Mile End. *The "Ambulator," 12th edit., 1820, says that in one of these houses the widow of Captain Cook found an asylum. She died in 1835, and was buried with her sons in St. Andrew's-the-Great, at Cambridge, beneath her husband's cenotaph.

WE understand that at the instance of Mr. E. E. Newton, of Hampstead, the Society of Arts have agreed, the owner and tenant consenting, to affix a memorial tablet on the house in John-street, Hampstead,

* In the "Dictionary of Architecture," *z.v.* Wren, we read: "1695. Trinity Almshouses; 30 houses said by Wren." In a large collection of papers, prints, &c. relating to Deptford, at the British Museum, is J. P. Malcolm's view 1799, of the old Trinity Hospital there.

where Keats lodged during most of the period 1817-20. The house is one of the two that were formerly called Wentworth-place, and were once occupied by Charles Wentworth Dilke and Charles Armitage Brown; it is now known as "Lawn Bank." In the other house lived Mrs. Brawne and her daughter Fanny, with whom—according to Howitt's "Northern Heights of London," Keats and his younger brother Thomas (*obit* 1818) had lodged before they removed to Mr. Brown's next door; and W. M. Rossetti says, in his edition of Keats' poetical works, that Fanny Brawne was for a while an inmate of Mr. Brown's house "to be out of the way of some domestic discomfort." The identity of "Lawn Bank" had long been a vexed question among admirers of the poet, including his editor Buxton Forman, but was determined by Mr. Sidney Colvin, who, in the *Athenaeum* of September 12, 1885, described a visit he made there in company of the late William Dilke in July of that year.

THE Fine Art Society announces an exhibition, early next month, of Mr. Whistler's collected lithographs, which will be an incident of considerable interest in the artistic world.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE second meeting of the present Session of this Institute took place on Monday last, at 9, Conduit-street, Mr. F. C. Penrose, M.A., F.R.S. (President), in the chair.

Portrait of a Past-President.

Sir A. W. Blomfield, A.R.A., said that it became his pleasing duty, as the representative of a large and enthusiastic body of friends and subscribers, to present to the Institute the long and anxiously-expected portrait of the late President, Mr. Macvicar Anderson. If he was not aware of Mr. Anderson's retiring and modest nature, which would make any praise of himself in his presence somewhat embarrassing, if not painful to him, he could have wished that he had been present that evening, to give them the opportunity of comparing the well-known form and features of the living man with their counterfeit presentment in the portrait by Mr. Charles Furse. He was sorry to say that the painter had been obliged to go to the South of Africa to recruit his strength after severe illness, which was the cause of the long delay in finishing the portrait. He thought he might confidently predict that henceforth it would be regarded as one of the most interesting and valuable of the numerous memorials of former Presidents which were on the walls. No one would doubt what a very great pleasure it was to be called upon to perform such a duty, yet the duty, pleasing as it was, had its difficulties, for the great debt of gratitude the Institute owed to Mr. Anderson was in itself an element of difficulty. It would be impossible to speak in adequate terms of the greatness of Mr. Anderson's services without overstepping any proper limits of time, and without indulging in praise which to any stranger might seem like the language of hyperbole. He would, therefore, content himself with reminding them that Mr. Anderson's services had been in many respects altogether unique and unprecedented, so that, in such matters as regular and punctual attendance at Council and other meetings, and generally for his self-sacrificing devotion to the multifarious cares and duties of his responsible position, Mr. Anderson might, if he might use a colloquialism of the day, be said "to have triumphantly broken all previous records and hopelessly distanced all competitors." Speaking of Mr. Anderson as pre-eminently a worker, they must not forget that to his great achievements in that respect he added several qualities, the lack of which were greatly missed by many when they aspired to be leaders of men. The late President possessed the tact, judgment, and firmness necessary to steer them on many occasions through troubled waters, and to bring them out of difficult situations with flying colours and unimpaired credit and honour. In thinking over Mr. Anderson's career as President of the Institute, he was reminded of some lines of Wordsworth, in which he says of a fine character that he is one "Who comprehends his trust and to the same keeps faithful with a singleness of aim." Of the charm of his attractive qualities and his great personal influence,

always exercised to some good purpose, and in the most genial manner, it was scarcely necessary to remind them, and it only remained for him, on behalf of the subscribers, to ask the President of the Institute to accept the portrait.

Sir A. Blomfield then unveiled the picture. The President said that it was with great pleasure he accepted the portrait on behalf of the Institute. It was impossible for him to add any more suitable words than had been already said, and, therefore, he would confine himself to returning their most hearty thanks to Sir Arthur Blomfield, and the others who had contributed with him, for offering this beautiful record, which would be a remembrance of a President whose name would never be forgotten as one of the greatest and most useful workers in this Institute.

Intermediate Examination.

The President then announced that a statutory examination was held, under the provision of Section 140 of the London Building Act, 1894, on November 7 and 8. One candidate had attended and passed, viz., Mr. Harold Griffiths, of the London School Board offices, who had been granted a certificate of competency to act as District Surveyor in London. He also announced the result of the Intermediate Examination to qualify for registration as Student, held on 13th, 14th, 15th, and 16th inst. At this examination fifty-one probationers, including sixteen relegated from previous examinations, had applied; forty-two had been admitted, all of whom presented themselves and were examined. Of these twenty-two passed, and twenty were relegated to their studies. The twenty-two, placed by the Board of Examiners in order of merit, were:—

Harold Busbridge, Plumstead, S.E.; Frederick Milton Harvey, Gorsestons; John Stevens Lee, West Kensington; Thomas Wilson Aldwinckle, Forest Hill, S.E.; Henry Arthur Battley, East Dulwich, S.E.; Herbert Edward Ilingworth, Rawdon, near Leeds; John Frederick Duthoit, Dover, and George Walter Shipway, Peckham, S.E.; Alfred Ralph Keighley, Liverpool; Ernest Henry Alderson Barron, Mannamend, Plymouth; Walter Gray Ross, Norwich; Ethel Mary Charles, Portman-square, W.; Samuel Chesney, Stourbridge; Matthew George Martin, Bellingham, Northumberland; Alfred Bryer, Brentford; Norman Elliot, Lampton, Hounslow; Edward Vincent King, Bishop Auckland; Arthur Ernest Lacey, Brixton Hill, S.W.; Gerald McMichael, North Malvern; Dudley Christopher Maynard, St. Leonards-on-Sea; Frederick John Sawyer, Brighton; Henry Knowles Wright, Bowdon, Cheshire.

The name of the lady was received with applause.

Sculptured Columns of the Temple of Diana at Ephesus.

Mr. Alexander S. Murray, LL.D., F.S.A., then read a paper on "The Sculptured Columns of the Temple of Diana at Ephesus," of which the following is a résumé:—

In opening his paper Dr. Murray referred to the late James Fergusson's views on the subject of the sculptured columns, which had been discussed by him in a paper communicated to the Institute in 1883. Fergusson had supported his views mainly by reference to the remains of the columns at the British Museum. Recently Dr. Murray's department of the Museum had undertaken the task of reconstructing the remains, with a result, however, which varied in several particulars from that arrived at by Fergusson. In working out his restoration, Fergusson had found it necessary to interject between the sculptured drum and the square pedestal an imaginary base. This base, or any intervening base, had been dispensed with altogether in the Museum restoration. The sculptured drum had been found to fit exactly on to the square pedestals, the bed on the top of the pedestals having been eased off on the outer edge for a width of about two inches, apparently for the express purpose of taking the weight off the torus. The effect might seem strange, but instances existed in the sculptured columns of Trajan in Rome and of Theodosius in Constantinople, where the shaft was separated from the pedestal mainly by an enriched torus—such columns, indeed, might have been originally suggested by those at Ephesus. The absence of any intervening member between the drums and pedestals of the front row of columns was not much to be regretted, but coming to the second row there was a difficulty in the columns not having under them some form of base which would range with the Ionic bases along the sides of the Temple. The lecturer here entered at some length into his reasons for thinking that the square pedestals had stood on a lower platform at the two ends of the Temple, citing in this con-

tion the description of the ruins and the measurements given by Wood, from whose views on some points he dissented, and showing in what respects the Museum restoration differed from Fergusson's. For the ascent to the stylobate Wood had proposed a flight of fourteen steps, but around the Temple, each with a tread of 19 in., but as this left an enormous projection of stylobate outside the columns, and as the rise and tread of the steps seemed to be correctly ascertained, Fergusson felt himself driven to assume a sub-platform of three steps, on which platform he placed a series of wide projecting piers, which he supposed to have been richly sculptured. Dr. Murray had taken advantage of this platform for the two ends of the Temple, and had placed on the sculptured pedestals, in room of the projecting piers which Fergusson had introduced without any trace of evidence among the remains. The thirty-six sculptured columns Dr. Murray disposed as follows: two between the ante without bases or plinths; a row of eight, also without bases or plinths, resting on the top of the steps; and a front row of eight, raised on square sculptured pedestals to the level of the stylobate, and entirely in front of the steps. With regard to the arrangement of the steps, for the lower platform three steps corresponding to the actual stones now in the Museum had been adopted, while for the upper platform the slightly different dimensions of the great altar at Pergamos had been introduced. So far it had been ascertained that certain of the sculptured columns had stood on square sculptured pedestals, but how many had been pedestals, or whether all of them had not been so enriched, it was quite impossible to say. It seemed incredible, however, that any one of the huge pedestals could have stood on the stylobate. It did not follow, again, that because certain of the sculptured columns had stood on pedestals at a lower level, the whole of the front columns had so stood. His own view of the matter, as illustrated in a drawing exhibited, Dr. Murray claimed to be the simplest way which had occurred to him out of a great difficulty. As regards the sculpturing of the lowermost drums of the columns, the lecturer gladly accepted the evidence of certain late Roman coins which provided to represent the façade of the Temple. He much-discussed question as to the interpretation to be placed on the words "una scapo" used by Pliny when speaking of the columns sculptured in relief, was here touched upon, the lecturer suggesting the reading "imo scapo," meaning in Vitruvian language the lowermost part of the shaft. This reading confirmed the ins and was in agreement with the existing remains. With regard to the dimensions of the columns, it seemed probable, from a large fragment sent home by Wood, that the angle columns were of greater diameter, which would imply a proportionate increase in height. It was, however, with the sculptured columns that the Museum was chiefly concerned—were they sculptured on all four sides? In considering this question the lecturer gave a detailed description of the remains, the inferences he had been able to draw from them with regard to the subjects depicted on the pedestals, and the manner in which the fragments had been utilised in the process of restoration. Taking into consideration the possibilities, he had arrived at the conclusion that the pedestals were sculptured on four sides, and that the sculptures were in cases an identical repetition of subject on four sides, in others a series of incidents connected together in thought, but not united by an artistic motive. Turning to the earlier Temple of Ephesus, the one burnt by Herostatus, on the ruins of which the Temple above dealt with was based, the lecturer described various remains of the ruins of the building among the collections of the British Museum, dwelling upon their distinctive features. According to Herodotus the costliest of the columns of the archaic Temple destroyed by Cressus—a statement confirmed by Wood's discovery of several parts of a base of the older building on which the Temple of Cressus was inscribed as the donor. Capital recently put together from the archaic fragments at the Museum bore a striking resemblance to one from the Temple of Hera in the temple—a fact of peculiar interest, as Herostatus, architect of the Temple in Samos, also executed certain sculptures for the Temple at Ephesus. Summing up, the lecturer affirmed his conviction on the following three points—first, that sculptured drums rested directly on the square pluted pedestals as they had been placed in the Museum restoration; secondly, that the pedestals were sculptured on all four sides; and, thirdly, that the sculptured pedestals could not

have stood on the stylobate without producing an extremely disagreeable effect.

Professor Aitchison proposed a vote of thanks to Dr. Murray, but apologised for having so little to say to the subject. The proper disposition of the carved columns and the carved square blocks had offered to architects the greatest difficulty of solution. Of late years the restoration of the temples of antiquity had not engaged the attention of so many architects as they formerly did. It was a curious thing that so little contemporary description of this splendid Temple should have come down. There was the short account in Pliny, a few words in Pausanias, Strabo, and Vitruvius, and it really looked as if the descriptions by these authors were merely hearsay, and that none of them had ever seen the Temple, though it was one of the wonders of the world. He had listened with great admiration to the elaborate pains which Dr. Murray had taken to make the pieces fit. He had watched for years the piecing together of the Archaic base, and admired the extreme ingenuity with which these fragments had been fitted together, but without having studied the subject, it would be useless for him to offer any further remarks, except to say how extremely obliged they were to Dr. Murray for what he had done and for what he had said that evening.

Professor Roger Smith, in seconding the vote of thanks, said he could add very little to the learned and extremely interesting paper with which they had been favoured. It had always seemed to him that the recovery of the Temple of Diana at Ephesus had been a kind of triumph for British archaeology, and was a matter of which they ought to be proud. Mr. Wood had pursued a scent, which might have easily led him astray, but he had avoided that snare. They were extremely indebted to the Director of Antiquities at the British Museum, for the care with which he had brought together the remains entrusted to his charge, and it was extremely interesting to be able to elucidate some of the things which Mr. Wood had left unsettled, and which it was impossible for him to settle. One might hope that it would be still reserved for some future day to discover further specimens on the site, and if that were the case he had little doubt that in the main they would bear out the views which had been put before them that evening.

Mr. R. Phené Spiers remarked that five or six years ago, when called upon to revise "Fergusson's History," he found himself placed in a singular dilemma. The original account which Fergusson had given of the Temple of Diana at Ephesus was in the edition of 1875, and at that time the data it contained did not differ very much from what had been put forward by Mr. Wood. The only difference, if he remembered rightly, was that Fergusson placed four of the sculptured columns in the pronaos, whereas Wood placed two in the pronaos and two in the postium. Fergusson read another paper to the Institute, which contained some statements of so extraordinary a nature that he (the speaker) really felt it would be unsafe to put them before the student as being the actual arrangement of the Temple. Fergusson, in that paper, happened to have hit upon the happy thought that three times nine were twenty-seven, and he consequently placed three rows of columns, nine in each row, at the back of the Temple, thus arriving at the 127 columns supposed to be named by Pliny. This also gave Fergusson the opportunity of lengthening the Temple, and of thereby introducing two open courts, through which light could be admitted. The idea of the nine columns seemed so impossible as a reasonable restoration, that he (Mr. Spiers) contented himself with reproducing all that had been stated before, and with merely referring the student to the paper read in 1883. It seemed to him that if Fergusson had been able to hear the paper that evening, he might have been willing to accept at once the new information Dr. Murray had submitted, viz., that the pedestals had been sculptured on all four sides, and have brought his columns forward. He was near the truth in placing the raised platform round the buildings, but it did not occur to him that the pedestals were sculptured on all the four sides. This was a new phase in the history of the Temple, and the version Dr. Murray had been able to give was the first they had seen, in which the relative height of the square pedestal and the sculpture of the other columns was dealt with.

Sir Henry Howarth expressed the pleasure with which he had listened to the paper, but was somewhat surprised that any Philistine present

should be asked to criticise such a subject. He would beg them to pardon him then, if he, for a moment, adopted the attitude of the German professor, who was compelled by the very necessities of his position to find some new theory to justify his own existence. It seemed to him that, at the early stage in the history of the Ionic column, as illustrated in the excavations of Susa and Delphi, they had the primitive column without any fluting, and in the second case they had it with rude fluting. It was a remarkable fact that the introduction of fluting apparently into both the Ionic and Doric column was very widespread, and it might be asked how it was that this great revolution took place in the history of this wonderful feature of Greek architecture. He could not help thinking that the fluting of the column came from Egypt, at the time when the Greeks were considerably indebted for all kinds of new ideas in sculpture and architecture, by contact with the Egyptian Doric columns, which were fluted. If they carried that further they would find the cause and origin for these sculptured columns, of which the only examples in the Greek world they knew of were those in the Ephesian Temple. The period when this was being built, was the time at which Polycrates, with his friend the Egyptian King, was building the corresponding Temple at Samos.

In Egyptian temples and buildings these columns were to be found, the upper half, in many cases, free from sculpture, and the lower half surrounded with friezes, after the primitive fashion developed later in the sculptured columns at Ephesus. They might, therefore, have a little side-light thrown on the problem of how the columns stood, if the question was approached from the side of the Egyptian temple, with its columns sculptured in relief. He would have considered this an immediate key to an explanation of the matter, but there were two difficulties which presented themselves when he saw the marvellous reconstruction of the columns entirely due to the skill and knowledge of Dr. Murray. When he had put together the inscription of Cressus, which gave the date of the column, it showed that it was impossible it could have been placed on a square base, or the inscription could not have been read. There was no doubt that the round drum fitted into a round hole in a square base, and that that square base must have had some kind of round erection placed upon it; but might it not be the base of either a statue or of some kind of erection within the Temple itself, in which the base of the statue was made of the same diameter as the diameter of the column? He could not see the smallest trace of a square base on the many columns he had examined; they all appeared to be circular right to the very ground. It would seem that the great Italian artists, when they painted "The Beautiful Gate" of the Temple, designed it from the idea of Pliny, and planted the sculptured columns directly on the ground, and not on bases. He only put these remarks forward in order to get Dr. Murray on his feet.

Mr. G. A. T. Middleton referred to the peculiar Corinthian column on an elliptical base, in the British Museum, and wished to ask Dr. Murray whether he had come to any conclusion as to where that column had been placed? There were, as was well-known, upon the uncult eyes of one of the volutes in the Museum, certain centre-points and scratchings, and he had asked Dr. Murray at the Museum whether these had been carefully worked out in an endeavour to find out how the volute was described. The answer was in the affirmative as to their having been several times carefully drawn and worked, but in the negative as to the discovery of the way in which the volute was struck. There was, however, an opportunity of comparison with another example in the British Museum, an Ionic capital, in the Mausoleum Room, with an uncult eye, on which certain points were to be seen. This was quite a small capital, and the centre-points were so minute as to escape casual examination.

Mr. H. Heathcote Statham thought they might congratulate Dr. Murray on having brought before them a more probable and a more logical explanation of the part which the square sculptured pedestals played in the Temple than had ever been offered before. For himself, ever since the late Sir Charles Newton showed him on the top of those square blocks the circular drip-mark of the torus, he had had the most absolute conviction on the subject, and he never had the slightest doubt that the square pedestals supported a column. Dr. Murray seemed to have found, by providing a lower platform near the bottom steps, a place for the square pedestals by which they could support a column of the same proportions

as the inner row which would stand upon the upper steps. It seemed to him (the speaker) by far the most probable solution that had yet been afforded them. There was one interesting point in the remains that they had never had an explanation of yet, and which Dr. Murray had touched upon, and that was the one circular sculptured drum which was 3 in. thicker than the rest. It was a very curious consideration as to what part of the Temple that could have belonged to. Dr. Murray suggested that in consequence of its width they might imagine it to have a greater height. He also referred to it as being possibly at the angle of the Temple. Of course, to put an increased width in a column at the angle of the Temple was a perfectly natural and frequent device, though to go to the extent of three inches would be a great deal. But he should be rather inclined to think that the angle position was the explanation of that. At all events, they could hardly imagine where that column could have come if they were to suppose it to be of a different height from the rest. There was another point about that sculptured drum: if he remembered rightly, it showed signs of being a great deal more weather-worn than the rest. [Dr. Murray signified that such was the case.] That would be some indication of where it stood—at all events, an indication that it stood in a more exposed position. When those who were interested in the subject were able to see what was at present in the basement of the Museum, and which would be brought up eventually, they would find a most interesting object in that archaic Ionic capital from the older temple which had been referred to, which had differences of the most peculiar and unexpected nature from the normal Ionic capital, and he was quite sure that they would admire very much the ingenuity with which it had been put together from the very small actual remains which there were. The remains were pieced up with it, but they were so very small that it was really quite a feat to have put together the capital in the way that had been done. Dr. Murray, in passing, had used one expression which recalled to him an idea he had often heard before. He spoke about the Late Roman coins, and said they were more valuable in regard to what they showed than to what they omitted. Now, in looking at coins for the light they were able to throw upon ancient architecture, it was extremely important to remember what the medallist put in was, in fact, all that was of any value; what he omitted need not be considered, for this reason: a man engraving a building upon a coin—for instance, a man putting the Temple of Ephesus on an Ephesian coin—desired to make it recognisable, and he did so as far as he could within the limits of his space, and the possibilities of engraving on a small scale. Therefore, whatever they found on the ancient coin they might be certain there was some reason for. What a man left out might be to save himself trouble. Any feature to be found in an ancient coin professing to represent a building of a certain city was almost overwhelming proof that something of that sort was there; because otherwise the man who made the coin would never have given himself the trouble to put it in. That, he thought, was sometimes a little forgotten in estimating the value of evidence from ancient coins. One other remark he wanted to make. It was not quite correct to say that Mr. Wood was never misled. Mr. Wood showed wonderful pertinacity and perseverance, and never knew when he was beaten; but the fact was that he looked for the Temple for six years on the wrong side of the city, although the literary evidence that it was on the other side was quite accessible.

Mr. Phené Spiers said that Sir Henry Howorth's remarks reminded him of what happened at the British Museum on one occasion when he was there with Dr. Murray. The late Mr. Watkiss Lloyd then came up and asked, "Is there any new German theory?" At that time these German theories were coming over about once a week.

The President said he had listened with the greatest delight to the amount of information given in the paper, and to the extremely clear way in which it had been given to them by Dr. Murray. He had not himself particularly studied this Temple, and there was very little that he could communicate on the subject. He had been at Ephesus, but only for two or three hours, and for a particular purpose, though he was even then able in the time to demolish one of the grounds which Fergusson offered to support his theory of the nine columns. Fergusson said was obvious there must have been nine columns, because from that side there was a hill which

entirely hindered the possibility of a view of the Temple. He did not remember exactly the words, but that was the gist of the argument. Now, it so happened that there was no hill at all, near enough to interfere with the view of the Temple. There was, indeed, Mr. Wood's excavation mound—his "spoil-bank," so to speak—which, when one was down at the bottom of the diggings, where ponds now occupied the place of these excavations, one might be hindered from looking east and west; but there was nothing of the nature of a hill, when the ground was clear; so that the question of the nine columns could not rest in any way upon the nature of the site. He was not quite sure that he agreed with Sir Henry Howorth, but he would say little on that point, because no doubt Dr. Murray would take care of himself. He did not see that it was necessary for Cressus to put his name on a conspicuous place, but he might have been glad to place it where the square base hindered the ordinary sightseer from noticing it.

The vote of thanks was then put, and carried by acclamation.

Dr. Murray, in reply, thanked the meeting for the very cordial reception they had given his paper. He valued highly the opinion of architects, and indeed owed very much, in the course of his professional work, to such men as Professor Atchison for their advice and encouragement, and also to some of the younger men, whom he saw so frequently in the Museum. It was a great change to go through the galleries on a Saturday afternoon, and find quite a crowd of the younger men drawing and measuring there; he did not remember such a thing a few years ago. Mr. Middleton had asked about the Corinthian Capital. He had not had time to work it up at all, but he did not see that it necessarily belonged to the Temple. Mr. Wood had found it on the site, but to what building it had belonged he (the speaker) could not at all guess. He was afraid he could not answer Sir Henry Howorth, but he would not like to see statues put on the tops of those square pedestals. Sir Henry Howorth had touched on several points, and he thought he would have to read his paper over to that gentleman privately. What Mr. Statham had said about coins was very true and just, but it was also possible that a coin of Hadrian or Antoninus Pius, showing the front of the Temple at Ephesus, might have been struck in Rome or Alexandria, and taken not so much directly from the Temple by some one who knew it, as from some of the numerous shrines of Diana, which were sold to pilgrims, so that a great many liberties might have been taken with the original Temple.

Colonel Prendergast wished to know who had executed the beautiful drawings he saw exhibited on the screens.

The President replied that these drawings had been submitted by the probationers who had passed the Intermediate Examination, and had been exhibited so as to show specially what work the students could do in the provinces. The three sets of drawings had been produced by Mr. F. M. Harvey, Gorleston, Great Yarmouth, Mr. Harold Busbridge, Plumstead, Kent, and last, but not least worthy of notice, by Mr. Samuel Chesney, Stourbridge.

The President also announced that, on December 2 next, a business meeting would be held for the election of candidates for membership. The proceedings then terminated.

ELECTRIC-LIGHTING REGULATIONS.

THE Conference opened last Tuesday at the Westminster Town Hall by Sir Courtenay Boyle to consider the revised regulations for the supply of electric light (of which a long report appeared in the *Times* of Wednesday and Thursday), has been very successful. On the first day alone they had reached the discussion of Clause 27, notwithstanding the fact that Supply Companies were well represented. The principal discussion was on the meaning of high-pressure and low-pressure. Mr. Crompton, the President of the Institution of Electrical Engineers, and others, urged that the low-pressure limit should be increased to 600 volts; whilst Mr. Musgrave Heaphy, speaking from the fire insurance point of view, and Earl Russell as electrical engineer to the London County Council, much preferred the 300 volt limit. Dr. Hopkinson pointed out that at Manchester the pressure between the outer mains on the fire-wire system was 450 volts, and that in no single instance had trouble resulted. He thus admitted, as was pointed out by the Chairman, that at

Manchester they had been infringing the Board of Trade Regulations.

Major Cardew, speaking on behalf of the Board of Trade, made a very able reply to the attacks on the definition of pressure in the draft regulations. He said that numerous accidents which had already occurred proved that if they increased the pressure they would considerably add to the risk. He also reminded them that the demand for a higher limit of pressure came only from the Supply Companies, and he doubted whether any educated consumer would recognise the great advantage conferred by the introduction of 200 volt-lamps. We were surprised to see that several electricians recommended that no distinction should be made between direct and alternating current supply—a suggestion obviously made on behalf of alternating current supply companies, it being common knowledge that an alternating pressure is much more likely to break down insulation, and produces much more severe shocks, than a direct pressure of the same effective voltage. Mr. Gay, on behalf of the Islington Vestry, opposed clause 27—namely:—

"All conduits, pipes or casings used as receptacles for electric lines shall be constructed of durable material, and of ample strength to prevent damage from heavy traffic, and where they are laid in streets in which gas-mains are also laid, shall be so constructed as to prevent any influx of gas from the adjacent soil."

Mr. Freece, who followed, also objected to this clause, pointing out that in London alone there were 16,000 street-boxes in connexion with the electrical system of the Post-office, and notwithstanding all precautions it was impossible to keep gas out of them. Sir Courtenay Boyle stated that he would recommend the Board of Trade to accept a clause in place of this one, merely imposing upon undertakers the obligation of taking reasonable means to prevent the influx and accumulation of gas in boxes, and to give notice to the gas companies whenever an accumulation of gas therein was discovered.

At Wednesday's meeting the vexed question as to what constituted "street-boxes" arose, and, after some discussion the chairman suggested that the clause relating to the ventilation of street-boxes should apply only to those containing transformers. Mr. Hammond made the very sensible suggestion that the standard fixed for the insulation resistance of the wiring in a building should be 75 megohms divided by the number of lamps in the building. Anyone who has had any experience of the extraordinary rules about insulation given by the supply companies in London alone, hardly any two of which agree in their standard, will see the advantages to be gained by adopting a uniform standard. The Chairman promised to frame a regulation upon this basis, reserving for further consideration the particular standard to be adopted. At the conclusion of the meeting a very hearty vote of thanks was passed to Sir Courtenay Boyle, who, whilst he avoids advising the Board of Trade in the direction of grandmotherly legislation, takes the greatest pains to secure the comfort and safety of the public by throwing the responsibility on the proper persons.

DISCHARGED PRISONERS' AID SOCIETY, GLASGOW.

THE philanthropic, and at the same time valuable, work of this Society, which has been carried on for many years in very unsuitable premises of a more or less temporary nature, will shortly be continued under more favourable circumstances in the new building on the east side of Cathedral-square, which is being erected from designs of Messrs. Campbell Douglas & Morrison, architects, Glasgow.

The situation is in many ways convenient, being quite near the gate of Duke-street Prison, from which prisoners from long or short sentences are discharged every day except Sunday.

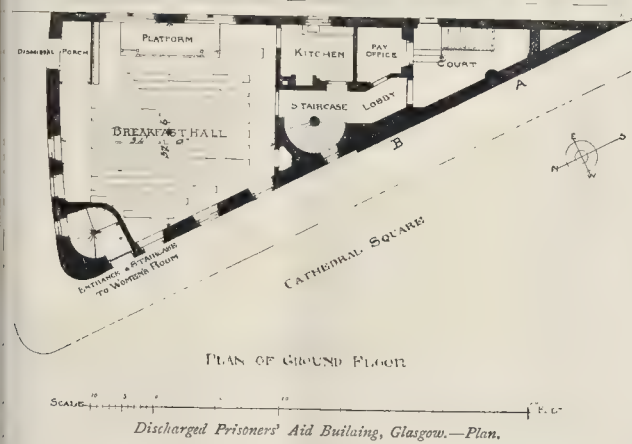
The style adopted is the Scottish of the seventeenth century, which is well-suited to the domestic character of the building, and is in harmony with what one finds in the older parts of Glasgow.

The site is peculiar, being a long triangle whose sides are each fully twice the length of the base, the latter at the same time following the curve of John Knox-street. The view we give shows the principal front, which faces Cathedral-square, and the south truncated end, which forms the north side of the entrance court, as may be seen from the ground-floor plan annexed. The ground falls about 8 ft. from the right-hand point round the two fronts to the dismissal porch.

As we give the plan of the ground floor, which



Discharged Prisoners' Aid Building, Glasgow. Messrs. Campbell Douglas & Morrison, Architects.



Discharged Prisoners' Aid Building, Glasgow.—Plan.

us in part a basement floor, it cannot show entrances at A and B, which are at the street level at the highest point. Men who are discharged arrive from the prison, and enter by the gateway at A, and ascend a stair in the court, pass through the lobby, and past the staircase to the breakfast hall, which can accommodate 100 persons. Men enter by the door at the left-hand corner of the building, and go up a stair to a similar smaller room on the first floor. The stair leading to the administrative department is entered at the place marked B on plan, leads to the Superintendent's room and offices, while in the upper floor a dormitory is added, under the superintendence of the care, for a few of the more deserving men who have gained the confidence of those carrying on the enterprise. The building will cost fully 3,000*l.* exclusive of the site.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

At the meeting of this Association on the 15th inst., the President, Mr. William Henman, delivered an address, in the course of which he entered at some length into the consideration of the relations of the provincial societies and provincial architects with the Institute. Referring in the first instance to the representation of the members of allied societies at the Institute Council, Mr. Henman said that as their representative he had attended three meetings of the Council of the Institute, but had not met on any of these occasions any other representative of a provincial society, though there were eight who were members of the Council. This was not as it should be, and though he would willingly testify to the able and business-like manner in which the work of the Council was conducted by many of the leading metropolitan architects, his experience of both London and country practice had

convinced him that if the influence of the R.I.B.A. was to be properly extended throughout the whole kingdom, much greater consideration must be given to the views, feelings, and requirements of those who had to reside as well as to practise in the provinces, because in several particulars their work had to be carried on under conditions different from those which existed in London. Referring to the remarks in Mr. Penrose's recent address at the Institute, on the falling off of the number of Fellows joining the Institute, Mr. Henman observed that the statistics given by Mr. Penrose* were somewhat startling, and continued—

"By further investigation of the lists in the Royal Institute of British Architects' 'Kalendar' for the current Session I find there are about 300 Fellows and 500 Associates (many of the latter eligible for election as Fellows) all resident in London and its neighbourhood, as against about 250 Fellows and 360 Associates residing in the provinces, the remainder being in the Colonies, &c.

Now it appears to me evident that if the roll of Fellows is to be largely increased from outside it must be chiefly from the provinces. If such be so, I know full well that if the gates be opened and country practitioners are invited to enter, the question will on all sides be asked: In what can membership of the Royal Institute of British Architects benefit us? And from personal knowledge I may add that many believe that as now constituted no good to them would result.

As I do not myself hold that view in its entirety, yet, from evidence around me, I cannot shut my eyes or ears to its frequent reiteration. I propose, with all due deference, to give some reasons why I believe it has become so firmly rooted, and to offer a suggestion or two in the hope that those more competent than myself to deal with the details of the subject may take it up, and bring forward proposals which will give confidence to many an architect who has the welfare of the profession at heart, and who, although he may not directly reap any personal advantage, will yet join its ranks in the belief that both in the metropolis and throughout the country, unity of action and motive will tend to the advancement and appreciation of our art, secure greater happiness,

* See Builder of November 9, pages 332, 333.

comfort, and convenience for the public, and ultimately benefit its votaries.

At the risk of it being supposed I take a mercenary view of the subject, I mention first the question of £ s. d. The country architect who takes any interest at all in his profession except as a vocation for mere money-making joins the local society, and probably pays his guinea or more subscription plus entrance-fee. He may also be a member of the London Architectural Association, and, if still more loyal to the profession, be Associate or Fellow of the Royal Institute of British Architects. In this way his annual subscriptions to architectural societies alone amount probably to double what they would be if he resided in London or the neighbourhood, although the privileges he acquires are small, and of those he can avail himself incomparably less.

The return of one-fourth of the subscription of membership from the Institute to the allied society does not relieve the individual.

I lay no great stress, however, upon this matter of subscriptions, because I believe that anyone of standing in the profession would willingly pay them, but to some it is a consideration; and, from a business point of view, they are entitled to ask what they will get for their money?

Well, let us see. An excellent publication—"The Institute Journal"—regularly delivered, but the principal contents of which anyone may read in the professional papers.* Then there is the right of attending the general meetings in London, and of voting on matters then brought forward; but how rarely are such attendances possible? And, should he be elected President of an allied society, he may have a seat on the Council of the Institute.

I have already alluded to the scanty attendance of provincial members at the Council Board. No doubt the difficulty of finding time, to say nothing of the expense, is considerable, but what is the result? Why, that the interests of non-metropolitan members are neglected. To give an instance of the way they are overlooked: at one of the meetings I attended, the appointment of a Competitions Committee was to be made; some eleven names were suggested, all metropolitan; but when I drew attention to that fact, and pointed out that by far the majority of competitions were for buildings to be erected in the provinces, the Presidents of three allied societies were added to the list, showing clearly a willingness to consider the claims of country members when duly advanced.

Let it not be supposed for a moment that what I have thus drawn attention to is in any way intended to be antagonistic to the interests of the Institute: from my earliest days—my father having been a member almost from its foundation—it has been a household word to me, and I was even taught to look forward to the day and consider it an honour, when I should myself become a Fellow; but, the statistics brought forward by Mr. Penrose, and the necessity there is for, not only maintaining the number, but largely increasing the list of Fellows, have induced me to point out somewhat plainly why it is I consider that many able architects, practising outside the metropolitan area, stand aloof.

In addition to which, no doubt, a serious blow to the accession of Fellows from outside was dealt when, by the petty action of a few newly-fledged Fellows and Associates, such men as our respected member and past-President, Mr. J. A. Cossins, were refused admission—men who, although unconnected with the Institute, had done good work in the profession long before their objectors were architecturally born—while at the same time others were elected whose principal claim was that they had slipped into being Associates without the necessity, as now, of passing the examinations.

The published lists of the allied Societies indicate that the senior members number 587, of whom only 149 are Fellows of the Royal Institute of British Architects, and 100 Associates. Yet in the majority of cases only those who have been in practice some years can be admitted

* Mr. Henman is quite mistaken here. The reports of the discussions at the Institute meetings are given nearly as fully in our columns as in the *Institute Journal*, but the papers read (with the exception of the President's annual address) are not given, by the wish of the Council, who retain the copyright in the papers read at the Institute; for which reason (as we have before explained) we have never given more than a short *résumé* of the Institute papers, although we have always had the full paper before us. The Institute has now definitely returned to its former system of preparing its own synopsis of the papers read, for publication in the professional journals; and the papers are only to be found in full, often with a good many valuable illustrations, in the *Journal* of the Institute. The *Journal* also contains a good many specially contributed articles, sometimes of considerable value, which are published nowhere else.—Ed.

to that Senior class. Consequently, as only seven years in practice is necessary to qualify for Fellowship of the Institute, the majority would, on that score, be eligible; but in addition to senior members of local societies, there are many able architects practising in the country who have neither joined the local society nor the Institute.

Take our own district; there are in the Birmingham Architectural Association forty-one senior members, of whom thirty-eight have offices in Birmingham; but only four of that number are Fellows of the Institute, yet the names and addresses of about 120 architects are given in the Birmingham Directory alone, while our district comprises the five counties of Staffordshire, Shropshire, Warwickshire, Worcestershire, and Herefordshire.

The question arises, Cannot something be done to bring some at least of this large number of practising architects within the ranks of the Institute?

I have read through its charter and by-laws, and find that according to Clause 76 'Branches of the Royal Institute may be established according to regulations to be made from time to time by the Council.' Yet throughout the 'Kalendar' there is no other reference to any 'Branch.'

The suggestion, therefore, which I have to make and commend to the favourable consideration of the Institute, yourselves, and all the allied Societies, has reference to the formation of such 'Branches' of the Royal Institute of British Architects in the larger cities and towns throughout the country, to take the place of the existing allied Societies with a view, not only of strengthening the Institute itself, but, in addition, to give greater vitality, influence, and scope for usefulness to the local Architectural Societies, by binding all together in one corporate body.

Although I am not prepared with a cut-and-dried scheme for bringing about such an Imperial federation of architects, I suggest that the Institute should, as proposed by Mr. Penrose, first obtain the necessary powers to enable architects, with the required qualifications, to be admitted to the class of Fellows without having to undergo the prescribed form of election at present essential, and that the Council should then enter into negotiations with the allied Societies with the object of transforming them into 'branches' of the Institute, provided an adequate number of practising architects of repute in the district are willing to become Fellows of the Royal Institute of British Architects and attach themselves to the local branch.

The branches so formed should then be all placed upon an equal footing as regards their constitution, and might consist of Fellows and Associates of the Royal Institute of British Architects, Ordinary Members and Hon. Members and Students.

Additional privileges might be granted as regards representation of the branches upon the Council of the Institute and the more special business affecting the whole body of architects might, by arrangement, be taken say at only four council meetings during the session, one of which might with advantage be held in rotation at a branch centre.

An adjustment of fees, on a more liberal basis than is at present allowed to the allied societies, could readily be made, and as much freedom of action locally as is now enjoyed might still be granted.

To encourage the attendance of local representatives at the quarterly Council meetings of the Institute a reasonable allowance for travelling expenses might be made to them.

I refrain from entering into further detail at present, but on the lines indicated the Royal Institute might be strengthened, and I feel sure it would be the means of bringing together in friendly intercourse many men having the same interests at heart, who, although now residing and practising in the same district, do not at the present time even know one another.

Having shown that in our Association there are but comparatively few members of the Royal Institute, it may be supposed that in dealing with this subject here it is somewhat out of place and does not concern you. I trust, however, you may not go away with that idea; for many of you are earnestly studying to pass the examinations in the hope of eventually entering the ranks of the Institute, and I doubt not you will appreciate the honour the more highly if you realise that it is a body of men truly representative of the architectural profession throughout the country, so that should you ultimately determine to settle down in the provinces you may rest assured that your interests will by it be safe-

guarded, and that you may, in connexion with your local 'branch,' render active service in ranks.

For my part, when a society claims to be representative of a class, I have no belief in being too exclusive, in the sense that, by methods of election, worthy men are shut out. The state of things which has grown up in the architectural profession cannot in a day be revolutionised.

Many who have expressed their ideas respecting the constitution of the Institute appear to me to reverse the order of precedence, and seem to hold the opinion that it is the Institute which is to make the architectural profession, and that the object is to exclude from its ranks all who cannot claim personal acquaintance with some of its members. In this way a number of able men hold themselves aloof, and carry out good work which is a standing witness that, to be an architect, it is not necessary now to be a member of the Institute.

Instead of which I am inclined to think that proper course would have been, at first, to have opened wide the gates and have admitted all by their works could show they had made architecture a study, and had to the extent of the opportunities successfully practised the art. Then the Institute could have said, Now, representatives as we are of the architectural profession, we tend, in the interests of the public and the better appreciation of our art, to admit only those to ranks who prove that they are willing, by systematic study, properly to prepare themselves for its practice. The new mystic letters, F.R.I.B.A., would then have become familiar to the intelligent public, as are the M.D. of the physician; and the majority instead of the minority of practising architects would in consequence have connected themselves with the Institute.

Do not suppose for a moment that this would be likely to lower the standard of education requirements which would in the future war the admission of those aspiring to be architects. The tendency of all democracies is ever self-correcting. Yet good and able men would no doubt be found to take the lead, and pronounce the *vade mecum*.

If it is proved that, under the new by-laws, the closing of the ranks of Fellow has been too precipitate, and I think that is clearly indicated by the figures quoted by Mr. Penrose, surely it is still possible to mark time for awhile; then, if the Institute is to increase its numbers and extend its usefulness and influence, it must not only invite those to enter its ranks who, by their works and actions have proved themselves worthy, but, in my estimation, it is absolutely necessary, before such will in any numbers accept the invitation that the Institute should consider more closely and carry out more thoroughly the legitimate requirements of the profession beyond the metropolises of the Metropolis, and so make membership of the Institute a voluntary necessity to who practise architecture as an art."

Illustrations.

CHOIR-SCREEN, ST. DAVID'S CATHEDRAL.

THE choir-screen at St. David's Cathedral was erected by Henry de Gower, who tomb it encloses, together with those of two unknown ecclesiastics. He was bishop from 1328 till 1347, and to him is also due the erection of the fine palace adjoining the cathedral, and other works at Swansea Castle and Lamphey Court.

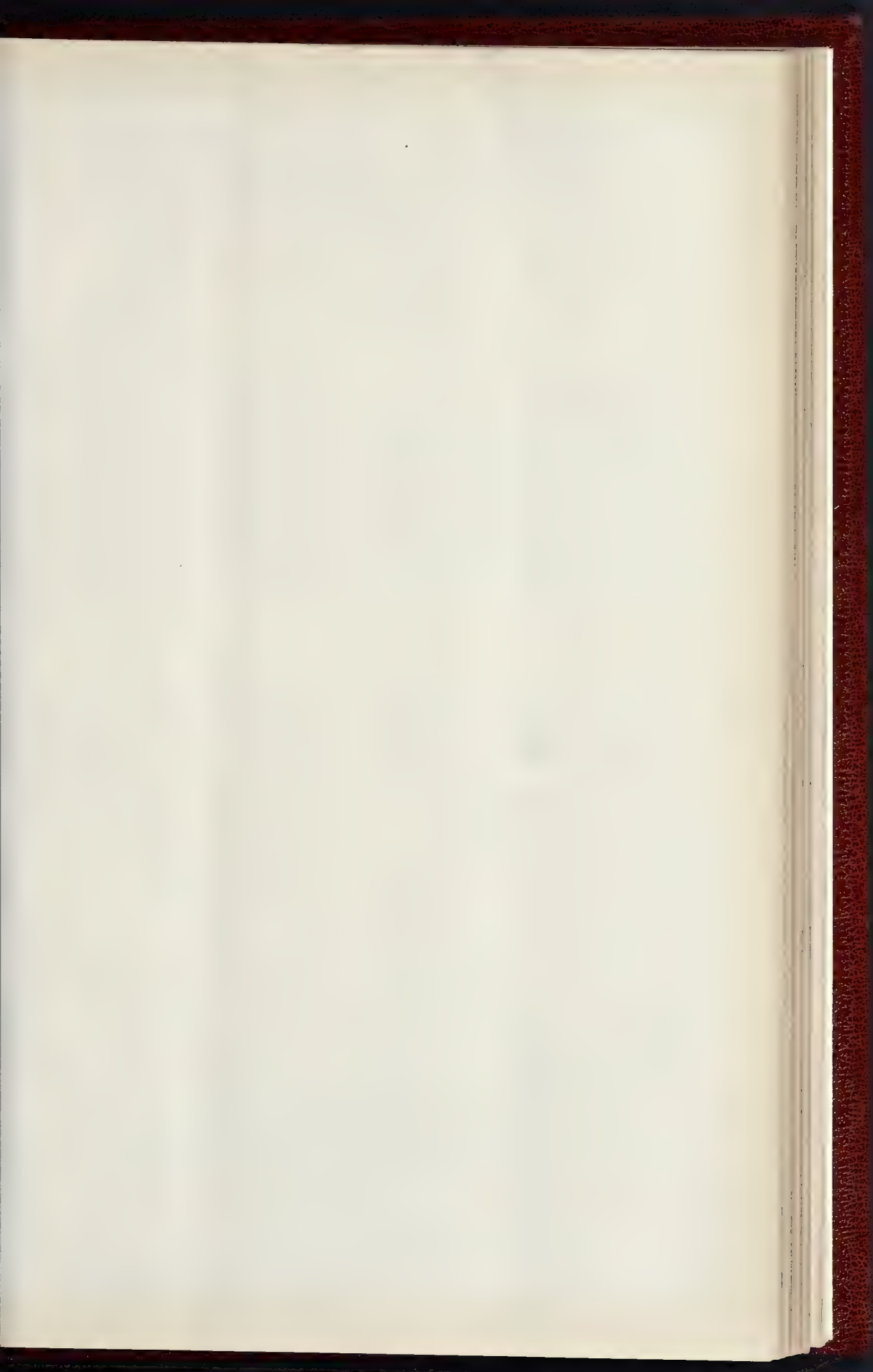
These works have so strongly marked individuality that they form a class by themselves. Whether their peculiarities of design are due to Bishop Gower, or to some artist of original genius employed by him, it is of course impossible to say.

The illustration is from a water-colour sketch by Mr. T. G. Jackson, A.R.A., exhibited in 1894 at the Royal Academy.

COMPETITION DESIGN FOR GLASGOW ART GALLERY.

This illustration shows the elevation and plan of the design submitted by Mr. Jas. Lindsay, the Glasgow Art Gallery competition.

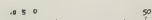
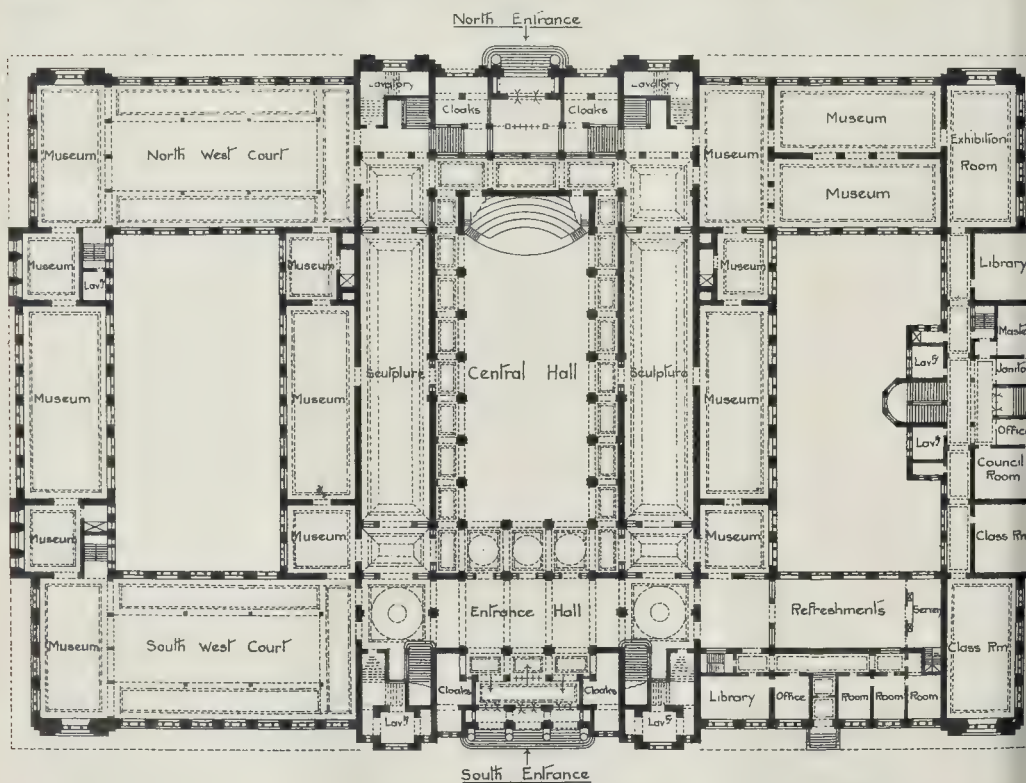
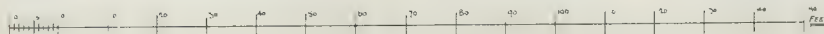
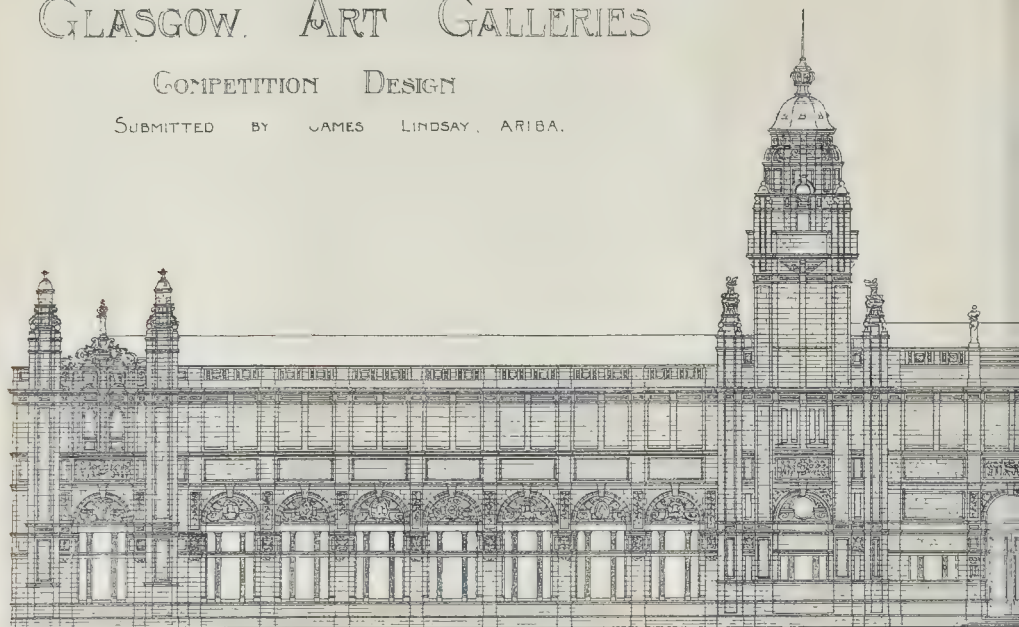
In arranging the plan it was assumed that the building would not be funds sufficient for the entire completion of the scheme all at once, therefore seemed desirable that the buildings should be divided into three sections, the central containing the large hall, with sculpture or promenade saloon with the entrances and staircases; the west-

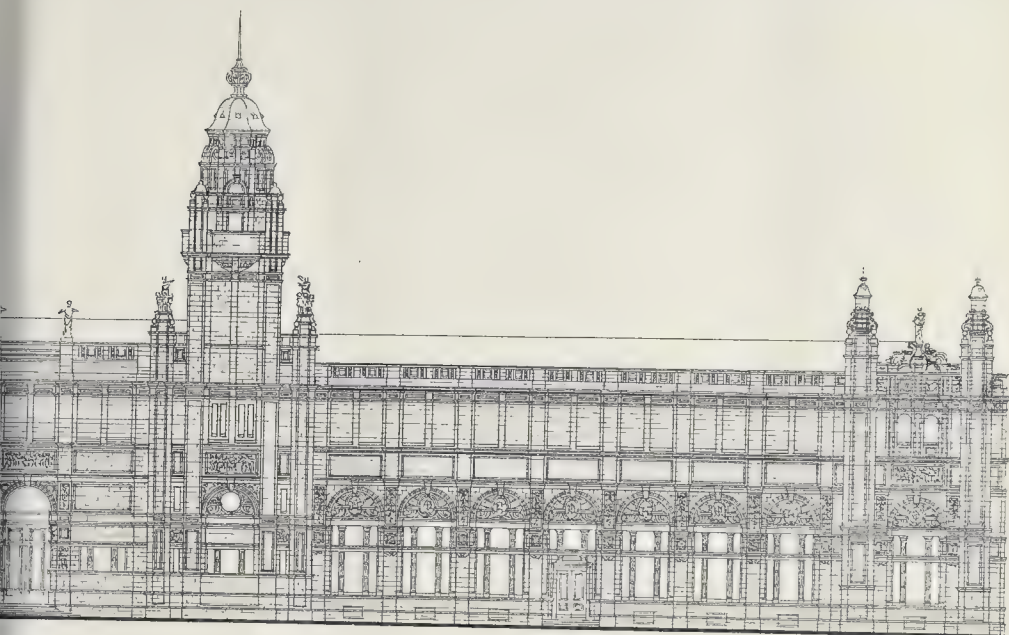


GLASGOW ART GALLERIES

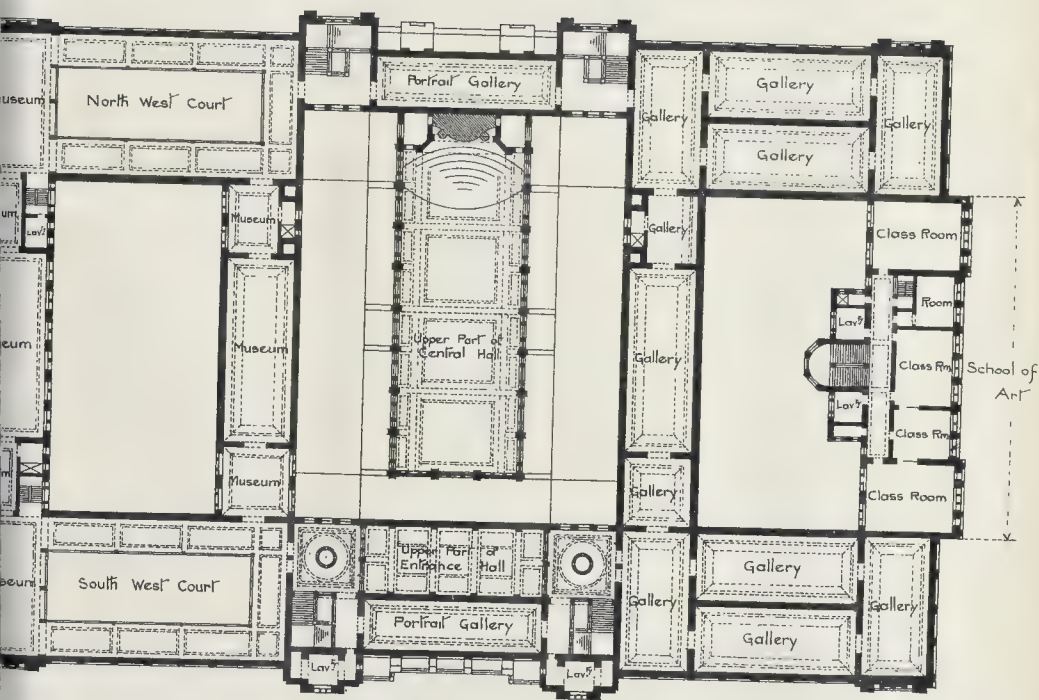
COMPETITION DESIGN

SUBMITTED BY JAMES LINDSAY, A.R.B.A.





ELEVATION



First Floor



THE BUILDER NOVEMBER 25 1895





THE CHOIR SCREEN, ST. DAVID'S CATHEDRAL. FROM A SKETCH BY MR. J. G. JACKSON. A.R.C.





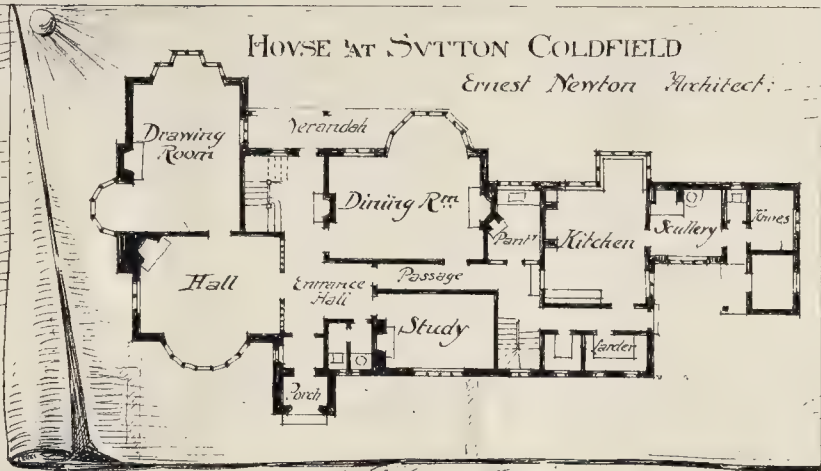
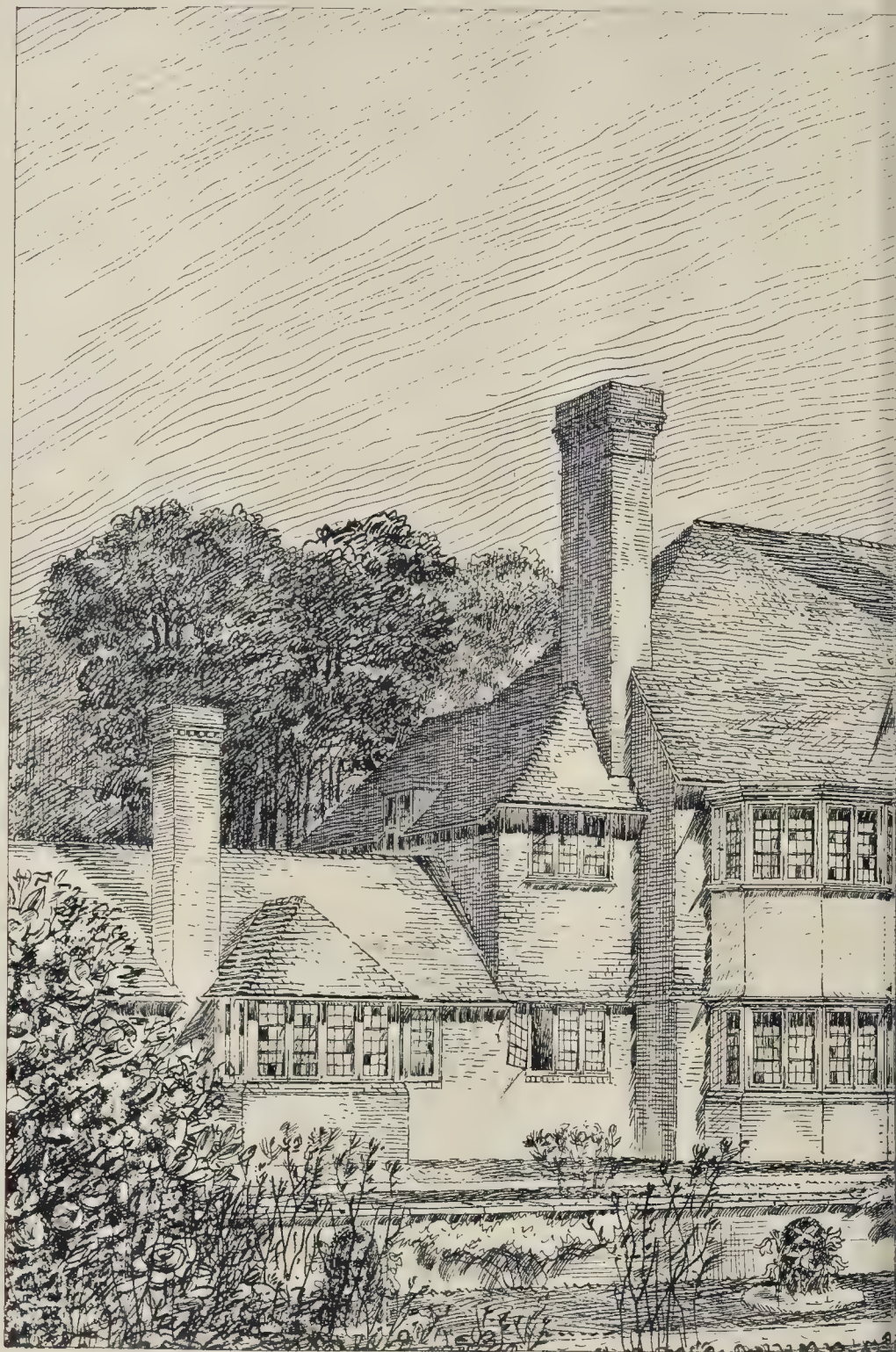


PHOTO L. THO. S. HAYES & CO. 46, EAST HARDING STREET, LONDON. ANS. E.C.





HOUSE AT SUTTON COLDFIELD



section containing a circuit of museum galleries and courts on two floors; the eastern section containing museum and picture-galleries, also the administrative offices, and the block for the School of Art accommodation.

The central hall being intended for occasional musical performances, provision has been made for communication from north to south and east to west independent of the hall, so that the assemblies in the hall would not cause any interruption to the lines of traffic throughout the buildings.

The staircases are placed close to the north and south entrances, and are so situated that they form either a beginning or termination of the circuits on either side of the central hall.

The picture galleries are all top-lighted, as well as the museum galleries, where not lighted by side windows, and the spaces underneath the galleries which surround the larger museum courts have light from side windows and not depending on the light from main roof.

JAS. LINDSAY.

HOUSE AT SUTTON COLDFIELD.

This house, of which we give two illustrations, is built from the designs of Mr. Ernest Newton, the materials used being brick and hand-made tile. The contractors were Messrs. Barnsley of Birmingham.

The plan of the ground-floor is given in one of the lithographs.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Repairs to Carriageway, Victoria Embankment.—The Highways Committee reported that they had had before them a memorial from the Great Eastern Railway Company, and a letter from Lord Claud Hamilton in support thereof, pointing out that the entire closing of the carriageway of the Victoria Embankment while under repair causes great inconvenience to traffic and to and from Liverpool-street Station, and asking that in future the work may be so carried out as to leave half the road available for traffic. With reference to this matter the Committee were informed that when the repairs were carried out in two longitudinal slips there was a difficulty in preserving the true form of the road and making it homogeneous throughout; and, further, that there was considerable risk of accident through the liability of horses to take fright at the noise and steam from the road-rollers, the use of which is an imperative necessity in repairing the road. They therefore thought it undesirable to adopt the course suggested in the memorial, and they recommended—

"That Lord Claud Hamilton, Chairman of the Great Eastern Railway Company, be informed of the reasons for the entire closing of the Victoria Embankment carriageway when under repair, and that, having regard to these reasons, the Council regrets to be unable to accede to the request contained in the memorial of the company."

Sir J. Blandell Maple, M.P., moved to omit the words "regrets to be unable to," and insert in their place the words "will, as far as possible." Colonel Rotton seconded.

Mr. N. W. Hubbard, Chairman of the Committee, said that the work was done in sections last time. It was the intervention of the Works Committee which stopped the system of repairing half the road at a time, because of the danger to life and limb. He hoped the Council would not pass the amendment, but that it would give the Committee an instruction which should absolve them from responsibility.

On a division the amendment was defeated, 46 voting for and 60 against.

Mr. Boulton then moved to refer the matter back, which was seconded by Major Probyn, and was agreed to. Mr. Burns, in the course of some remarks, expressing the hope that the Embankment would be paved with wood before long.

Churchyard Bottom Wood, Highgate.—The recommendation of the Parks Committee that the Hornsey Urban District Council be informed that the Council was advised that it had no legal power to contribute towards the purchase of Churchyard Bottom Wood was adopted.

The Works Committee and the Cost of Works.—The Works Committee reported the cost of

twenty-seven works they had carried out during the past six months. It was stated that the total of the estimates was 122,561l. 6s. 7d., and the actual cost 119,166l. 13s. 3d., showing a saving of 3,394l. 13s. 4d. While the actual cost of jobbing works had been 3,503l. os. 3d., the "value at schedule prices" had been given at 3,879l. 15s. 9d., so under this head there was a further saving, which amounted to 376l. 15s. 6d. Adding together the two favourable balances, and deducting the deficit reported in May on the sixty-two works previously undertaken, it would be seen that the "net profit" made by the committee was 1,049l. 16s. 10d.

Sir John Lubbock, M.P., said it was true that the figures showed a small profit, but the Council should remember that when the work was given to contractors the cost generally worked out at 6 per cent. below the estimate. Assuming that this would have been the case with these eighty-nine jobs, the work would have been done for 18,000l. less than the Works Committee had carried it out for.

Mr. Ward, Chairman of the Committee, said that the saving of 6 per cent. was on the original estimates, but if they took the revised estimates they would see that 10 per cent. was put down for extras, so that instead of a saving of 6 per cent. there had been really a loss of 4 per cent.

On the motion of Mr. Cohen, M.P., the debate was adjourned.

The new Lunatic Asylum, Bexley.—The Asylums Committee reported as follows, in reference to the new Lunatic Asylum for Bexley Heath:

"We have had before us the designs of the new Heath Asylum, Bexley, prepared by the architect, Mr. Hine, under the instructions of the special sub-committee appointed by us for the purpose. The plan of the main building is designed on the continuous principle combined with villas, and the asylum will be built near the northern boundary of the estate to the east of the present lodge. The principal entrance is in the centre of the north side of the building, and this block provides committeroom, office accommodation for medical officers, clerical staff, &c. Occupying the centre building to the south of the entrance block are the steward's stores, kitchens, recreation-hall, dispensary, and rooms for the principal officers, including a separate block for the assistant medical officers. Flanking the administrative offices on each side are the blocks for nurses and attendants, and in the rear of these are blocks for 120 working patients on each side, conveniently placed for the laundry or workshops. On either side of the administrative centre are the wards for the patients, the females on the west side and males on the east. The greater part of these are disposed on the south side of the main corridor, each side of which is formed into a quarter circle, the blocks being stepped back to obtain the greatest amount of sunshine and prospect; they are arranged in a continuous series, so that the officers can go their rounds without having to retrace their steps or traverse any of the main corridors. Part of the main corridor is widening out and arranged in recesses for use as visiting rooms, a direct approach to each being obtained by separate visitors' entrances on each side of the building. The laundry and workshop buildings occupy the remainder of the north frontage each side of the entrance block. All the traffic, therefore, of visitors, stores, and coal will be confined to the north side, and will leave the whole of the east, south, and west sides of the building entirely to the patients. The patients' blocks are all two stories high, and are divided into wards as follows:—Infirm, 224 females, 224 males; acute, 276 females, 226 males; epileptic, 180 females, 120 males; chronics and working, 300 females, 295 males; total, 980 females, 805 males. The main building will thus provide for 1,785 patients, and in addition there are provided one villa for 35 farm workers on the male side, two villas, each for 25 women, and a special hospital villa for 50 women, making a total of 1,100 women and 900 men. These villas will be staffed by themselves in the grounds adjacent to the main building. A chapel of sufficient size will be erected as a detached building on the north side of the asylum, and within easy distance of it. We should have preferred this to have been attached to the building, but in deference to the wish of the Commissioners in Lunacy it is placed as it is. An isolation hospital is provided to be erected near the north-east corner of the site, and the main entrance to the east of the chapel. The old mansion-house is, with some small alterations, to be adapted for the medical superintendent's residence. A house for the steward is provided near the entrance, and a new lodge opposite the present one for the engineer. All engineering works, comprising heating, ventilation, water-supply, lighting and laundry and kitchen machinery, are provided for and included in the cost of the buildings. In addition to the above-named buildings, which are all indicated on the plans, there will be required farm-buildings with a suitable house for the bailiff, which the architect has to design

when their requirements are determined, and are included in the amount of his commission. The architect has drawn our attention to the Council's present form of contract, and has expressed an opinion that if tenders be invited on the existing conditions the number received will probably be very limited, and the prices high in consequence. We have communicated these views to the General Purposes Sub-Committee who we understand have the question of the form of contract under their consideration. Most careful attention has been given to the plans which have been prepared with regard to strict economy combined with efficiency and modern requirements. It is necessary before a reliable estimate of cost can be submitted to have working drawings prepared and bills of quantities taken out, but we think it probable that the amount sanctioned by the Council for the provision of the Asylum, viz., 350,000l. (exclusive of site and equipment), may be exceeded in consequence of the larger proportion of accommodation for special cases which we have thought it necessary to provide, having regard to the class of patients we have lately been receiving. If, however, the conditions of contract be modified sufficiently to attract competition, we are of opinion that the excess of cost, if any, will be slight. We are of opinion that, under all the circumstances, the plans we now present are in every respect suitable for the purpose. We desire to emphasise the serious necessity of this asylum being built with the least possible delay, and we have accordingly approved the plans, and instructed the architect to at once proceed with the detail drawings for the approval of the Home Secretary. We recommend that our action be approved."

Mr. Burns said that any attempt, in erecting such a building, to keep below what he might call the Claybury standard for an asylum, would be a penny-wise-and-pound-foolish attempt.

Mr. McDougall, Chairman of the Committee, said he believed they would be able to build the asylum for 100,000l. less than what Claybury cost. There were already enough patients to fill the building, and the Committee were looking out for the site of another.

The report was then agreed to.

Action of Frost on Iron and Steel.—On the recommendation of the Bridges Committee it was agreed that, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Bridges Committee be authorised to conduct a series of experiments to ascertain the action of frost upon iron and steel, at an estimated cost of 100l., and that the cost be charged as an extra upon the Blackwall Tunnel contract.

Proposed Cable across Waterloo Bridge.—The same Committee recommended granting permission to the National Telephone Company to lay a cable across Waterloo Bridge. The Company proposed to fix a 2½-in. cable upon the east cornice of the bridge, and within a segmental galvanised-iron casing, 9 in. in width at the base by 5½ in. in height. The Committee said so large a casing would probably interfere with the architectural lines of the structure, and were of opinion that the Company should be restricted to the use of a 3-in. tube.

Mr. Roberts moved that the recommendation should be referred back, because it would detract the appearance of the finest bridge they had.

Dr. Longstaff seconded the amendment, remarking that he thought there were many other ways in which to get the cable across the river without using Waterloo Bridge—one of the finest monuments they had. There was a bridge not far from Waterloo Bridge whose appearance it would be impossible to spoil.

The recommendation was withdrawn.

Result of Legal Proceedings—Party-walls at Coburg-row, Westminster.—The report of the Building Act Committee contained the following paragraph, the recommendation being agreed to:—

"By our direction the Solicitor assisted the District Surveyor in police-court proceedings in support of his notice of objection, under Section 159 of the London Building Act, 1894, with reference to the party-walls in a warehouse building belonging to the Army and Navy Auxiliary Stores in Coburg-row, Westminster, the question involved being whether a wall can be 'party' as to some of its height and 'external' as to the remainder. In a similar case which arose early this year under the Act of 1855, and in which the Council took the view that the wall was a party-wall throughout, this point was decided against the Council, with 101. 10s. costs; and when the case now referred to came before the Magistrate he followed the previous decision, and overruled the notice of objection, awarding the defendant twenty guineas costs, but stating that if no appeal were made he would, on application by the Council, reduce the costs to an amount near to that in the previous case. We are of opinion that, for the guidance of District Surveyors in the execution of their duties, an author-

ritative decision should be obtained upon this very important question. We therefore recommend—

"That the Solicitor do take the necessary measures for obtaining a decision of the High Court upon the point whether under the London Building Act, 1894, a wall, which is admittedly a party-wall so far as it separates a building or buildings, can be deemed to be, for any portion of its height, an external wall."

The Council adjourned soon after 7 o'clock.

COMPETITIONS.

EAST RIDING LUNATIC ASYLUM.—On the 18th inst. the Visiting Committee of this Asylum, Beverley, adopted the report of their professional referee, Mr. G. T. Hine, and awarded the three premiums in this competition as follows, viz.:—1st, 50*l.*, "Ebor." Mr. C. H. Hebblethwaite, Hopwood Hall, Halifax; 2nd, 25*l.*, "Star," Messrs. H. Crisp and Oatley and W. S. Skinner, 27, Clare-street, Bristol; 3rd, 10*l.*, "Labor Omnia Vincit," Mr. Hy. Harper, Tavistock Chambers, Nottingham. The assessor in his report said that "the designs, which comprise twenty sets, including alternative ones, are on the whole very creditable, and show that much care and consideration have been given in their preparation."

ARCHITECTURAL SOCIETIES.

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING SOCIETY.—A meeting of this Society was held in the Lecture Theatre, Tullie House, on Monday last, when Mr. Percy Fitzgerald, F.S.A., delivered a lecture before a large audience on "Robert Adam and his Architecture."

NORTHERN ARCHITECTURAL ASSOCIATION.—The winter session of the Northern Architectural Association was inaugurated on the 13th inst., in the meeting-room of the Art Gallery, Newcastle. The President (Mr. Jos. Oswald) delivered his annual address. He reviewed the work, excursions, &c., of the last session, and said:—"The opportunities afforded by this Association for such visits to ancient and modern typical works, made in company with those who are best able to describe and appreciate them, together with our winter seasonal meetings, at which valuable papers are read and discussed, and our library steadily growing in importance, naturally attract to our ranks an increasing number of members. I note that our present strength is 140, being fourteen more than a year ago. The Association continues to offer bi-annually prizes to students and the younger Associates, for measured drawings and sketches from old work, done during the summer months, and for designs and other testimonies of study more adapted for winter exercise. It must not be overlooked, however, that our Association has within the scope of its operations other affairs than those I have yet referred to. These may, perhaps, be termed "internal," as affecting only, or chiefly, its members, old and young. But there are matters which may be called "external," as they affect the relationships between our profession and the public in general, or sections of it, such as the various building trades in particular. Having alluded to cases in which the Association had been called in to settle trade disputes, and having also referred to ancient companies, the President proceeded:—"One thing most noteworthy is, that in each and every company, stringent regulations were in force as to the taking and training of apprentices; the tendency in those days being apparently to excess in the number of them, calling for restrictive measures. In concluding my address to you last year, I ventured to call urgent attention to the tendency, in our own times, towards the opposite extreme. I feel sure that, from no other cause have the building trades in this country suffered so much during the last quarter of a century as from this. It is, for obvious reasons, difficult for a private individual to obtain trustworthy statistics as to any particular district in this respect, but it is certainly within the experience of all that the general standard of work has been, and is being, lowered in consequence of the decay of the old system of apprenticeship, and the absence, as yet, of any efficient substitute for it. To my mind, the solution of the difficulty lies largely in the hands of the trade unions. These powerful organisations have hitherto dealt chiefly with the financial relationships between employers and employed, but I trust, in this so-called enlightened age, the equally important relationship between the workman and the general public will be recognised by these unions." After referring to architects of the past and their work, the President

continued:—"It is surprising to note how, during the present century, the number of professional architects has multiplied, and that they all can find employment. They exist in accordance with a public demand, and what the public requires nowadays in the architect is, not an artist only or chiefly, but a man of business. The competition system has undoubtedly come to stay. The evils of the system exist, but can be ameliorated. Much has been done by the Institute and the allied Societies in that direction already, but more remains behind. In conclusion, the President spoke of the Institute, and the Association's representation thereon. Mr. W. H. Knowles moved a vote of thanks to the President for his address. The Hon. Secretary (Mr. A. B. Plummer) seconded. The motion was carried by acclamation, and the proceedings then concluded.

GLASGOW ARCHITECTURAL ASSOCIATION.—A lecture was delivered on Tuesday evening, in the rooms, by Mr. Percy Fitzgerald, M.A., F.S.A., London, on "The Work of Robert Adam, Architect," illustrated by seventy slides. The President was in the chair. At the close of the lecture, which has now been delivered at most of the architectural centres in England and Scotland, Mr. Fitzgerald was, on the motion of Mr. Campbell Douglas, seconded by Mr. T. L. Watson, awarded a hearty vote of thanks.

GLASGOW SCHOOL OF ART.—The President of the Glasgow Architectural Association (Mr. A. N. Paterson, M.A., A.R.I.B.A.) is the special lecturer on architecture this year at the Glasgow School of Art. His subject is "Domestic Architecture," in six lectures, illustrated by lime-light views. This is the third year of these lectures.

Books.

Architectural Engineering, with special reference to High Building Construction; including many examples of Chicago Office Buildings. By J. K. FREITAG, B.S., C.E. New York, John Wiley & Sons: London, Chapman & Hall. 1895.

FOR anyone who is practically interested in the erection of lofty piles of office buildings, such as those which are especially in fashion at Chicago, this is a very useful book; and it must be interesting to all architects from the information and experience which it gives in regard to certain methods of construction, though we are certainly not desirous of seeing the type of building with which it deals popularised in England. The whole system is one the object of which is in fact purely commercial, as is very frankly admitted in a sentence on page 47—

"Several gangs of men may frequently be seen at different levels on a single front of a building, and laying pressed brick by electric light was even tried on the Ashland Block, Chicago, in an endeavour to complete the building by May 1; and the intention was to make up for this extra expense of night work by time gained through leases signed earlier than would otherwise have been possible.

Cleverness in construction may no doubt be provided by such conditions, but good building in the best sense of the word cannot be. In fact, the whole problem considered in the book is that of getting up a building as fast as possible, and to as great a height as possible, consistently with immediate safety. "Thus, on the Manhattan building, the main cornice of terra-cotta was completed before the wall was built up beneath it. On the Unity building the granite base-wall was being built at the first and second stories, the pressed brick face was being placed at the twelfth floor level, while the hollow-tile arches were being set for the fifteenth floor—all at the same time."

The manner in which the work is designed seems in keeping with the whole thing. The architect does not trouble himself much as to the steel framing, which is put into the hands of an engineer, and the engineer furnishes details only of connexions and special points in the framing, leaving the rest to the contractor. In fact, the buildings seem to get themselves up on a kind of automatic system. Under these circumstances it is not surprising to meet with statements which show that, however cleverly these buildings are practically put up, their theoretical stability is provided for in a very haphazard manner. There are buildings, we are told, from ten to sixteen stories high in the City of Chicago, that possess absolutely no metallic sway-bracing; and others scarcely better, where sway-rods, as wind-laterals, were attached to pins through lugs on the cast columns, which lugs were of an ultimate strength of, perhaps, 25 per cent. of the

rods. This is probably in the cases where the enclosing walls are thick and solid, as it is then considered that any pressure which could bring the steel bracing into action would have damaged the walls before the bracing could be brought into action; and in that case the introduction of bracing for resistance to wind-pressure is a mere kind of structural superstition. There are other cases where the walls are a mere veneer, and where the steel bracing is a real factor of safety.

The author devotes a chapter to skeleton construction, followed by chapters on floors and floor framing, exterior walls, columns, wind bracing, partitions and foundations. In the course of the chapter on floors it is stated that American experience has led the writer to the opinion that soft tile or porous terra-cotta is much better fire-resisting material for the covering of the steel-work than hard tiles. "Johnson's patent flat arch," made of hard terra-cotta with thinner webs than ordinary, was at its first introduction exceedingly popular as a floor, and it was used in a number of the best buildings in Chicago; but a test by fire and water of hard tile blocks occurred some time ago in the rear of the Schiller Theatre building (we do not quite gather whether it was or was not an artificial testing), in which it was found that the blocks cracked to such an extent as to fall from the metal-work in large quantities. Soft or porous terra-cotta has been specified for many of the latest buildings, including the New York Life Insurance and the Fort Dearborn buildings.

In the chapter on Exterior Walls we are told that the recognition of the merely protective veneer character of the wall has gone so far that terra-cotta companies design their pieces with special reference to tying them on to or suspending them from the framework, and "the terra-cotta arches, which to the casual observer seem to carry some heavy wall or pier above, prove to be made of hollow clay blocks, held by wires or clamps to the concealed beams or girders which really support the roofs." A more unarchitectural system of construction it seems difficult to imagine; and whatever care may be taken at the outset to secure the stability of the structure, one would be prepared to find that such a building must carry in it the seeds of decay and disunion, and that under such a system "building for eternity," in the good old phrase, is a thing of the past. The manner in which immediate convenience is preferred before considerations of structural stability is indicated in the fact that, in the Columbus building at Chicago, built two years ago, a square hole was cut in the bedplates of all the super-imposed columns which carried the successive floors, in order to utilise the central space for carrying pipes up. This seems a little too much for the author, who admits that "such a cutting of the bed-plates cannot be too severely condemned"; not to speak of course of the fact that the pipes so placed cannot by any possibility be got at!

The chapter on Foundations contains some very interesting descriptions and sections of various methods of forming foundations for these very lofty buildings, some of which are admirable in themselves, considered as wall-bases, but appear nevertheless to be quite unsuited to the nature of the soil which forms the building base at Chicago. The soil underlying the city consists of a soft loam or quicksand 12 or 14 ft. thick, under which is blue clay, resting on limestone-rock from 40 to 80 ft. below the surface. The clay is estimated to bear 14 to 20 tons per square foot; but settlement is so universally looked for that every building is designed as for from 3 to 5 in. above its ultimate level. To pile, or form concrete piers, down to the rock, is considered too costly, and the Post Office and Custom House at Chicago were built in 1877 on a bed of concrete 3'6" thick, on the clay. Some parts of the building were extraordinarily heavy, others very light, and settlement has ensued to such an extent that the building is now known as "the ruin"; it has settled in some places nearly 24 inches. Failing the penetration to the rock, all foundations are designed in precise proportion to the load which they will have to carry, which of course is the logical process in any case. As the author observes, examples have been known, in Chicago and elsewhere, of light piers alternating with heavy ones being crushed through the mere fact of having too good a foundation for the weight on them, and failing to join in the general settlement. The employment of caissons sunk to the rock is mentioned in some cases; but for the most part there appears to be a lighthearted manner of building these enormously high buildings on the clay and allowing

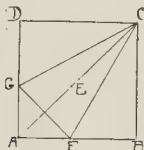
for settlement, which, again, is as much at variance with the idea of monumental architecture as the steel framing and venter of the building itself. Those however in this country who wish to study "how the thing is done" in the States, or at all events in Chicago, the paradise of tall buildings, will find Mr. Freitag's book of interest, and it contains some valuable statistics of various kinds.

Note-Book on Plane Geometrical Drawing; with a chapter on Scales, and an Introduction to Graphic Statics. By ROBERT HARRIS, Art Master at St. Paul's School &c. &c. London: G. Bell & Sons. 1895.

This is a useful first book for students, giving the working of a number of problems in practical geometry, with diagrams, a good account of scales and their use, and a good résumé of the main problems in graphic statics. The only fault we find is that in some minor details it hardly seems to have been got up with sufficient care. In the geometrical problems the same figure is in many cases made available for several problems, not always stated on the same page as the diagram, which also may contain features some of which are necessary only to a portion of the problems. In such case the matter would have been simplified to a young student by placing in brackets after each problem the number of the diagram referred to (the diagrams are numbered separately from the problems). On the first reference to the finding of proportionals there is no definition of "proportionals," and it can hardly be assumed that a student necessarily knows what is meant when he is told to "find a fourth proportional to the lines A B, C D, and E F." A student's book should explain itself. In Problem 128 we find this ordinate B E is a mean between " &c. The word "ordinate" has not as far as we can see been used before in the book, and it is not in the list of "definitions," any more than "proportional," or "harmonic proportion." The student must therefore be dependent on another book for the meaning of these words. As a pretty long list of definitions is given at the beginning, one cannot see why these should have been omitted from it. There is some carelessness of wording in other points. In the third problem, "From 1, with radius C 1, set off on the arc 1, 2, the points 3, 4," is wrongly expressed, as the diagram shows; the direction should be "from 1 with the radius C 1, set off on the arc 1, 2, the point 3; and from 3, with the same radius, set off on the same arc the point 4." In Problem 135 a point H is referred to which is not shown on the diagram; no doubt any sharp student would see where it should be, but all students are not sharp.

Are there not some venerable bits of pedantry in geometrical teaching that ought to be buried? Why should a student be told that to divide a straight line into equal parts he is to draw another line at any convenient angle to it and divide that line into equal parts, and draw parallel lines from the equi-distant points on A C to cut A B? Surely the natural reflection of the student is, why not divide A B into equal parts at once, instead of going round about to divide A C first? Or take the following, problem 125 in the book under notice:—

"In a given square to inscribe the largest possible isosceles triangle having a given base.



Let ABCD be the given square. Draw the diagonal A C. From A set off A E, equal to the base of the required triangle. Bisect A E by a line at right-angles, intersecting A B and A D in points F and G. The triangle F G C is the one required."

Taking an isosceles triangle the apex of which coincides with one angle of the square, it was surely hardly worth while to make a "problem" of the self-evident fact that the largest such triangle on a given base must be one of which the centre or "altitude" line coincides with the diagonal of the square. Another point to be noted is that the proposition here is "to inscribe an isosceles triangle in a square," while if the student looks in the list of definitions he will read that one rectilinear figure is said to be "inscribed" within another "when each angular point of the

former figure lies upon a side of the latter;" so that this self-evident isosceles triangle is after all not "inscribed" in the geometrical sense of the word, or at all events not in accordance with the definition given by the author.

Stress Diagrams. By W. H. BIDDER. London: Gale & Polden. 1895.

No one who has had any experience of the methods usually adopted for computing the stresses in engineering structures could doubt, after reading Mr. Bidder's book, that its author is thoroughly conversant with his subject. He writes in an enthusiastic manner, and it is easy to perceive he is actuated by a love of his profession. He has the impression that it is the duty of someone to point out the errors contained in various works that have from time to time been published on the subject which he has made his special study, but unfortunately a thorough acquaintance with any department of science is no guarantee that those possessing such have also the necessary ability to instruct others.

To an author of a simple text-book an exhaustive knowledge of his subject is often detrimental, since it frequently debars him from seeing the difficulties that present themselves in the same light as they are regarded by the student to whom he desires to explain them.

It is hardly possible to overrate the importance of writing books of this character in a clear and simple style so that there can never be any doubt as to what the author really means to say. It is not, of course, essential that they should be written with absolute grammatical accuracy, but they should at least approach this standard of perfection within measurable distance. Either Mr. Bidder is not of this opinion, or his eagerness to point out the mistakes of others has rendered him callous as to the language he employs in his own pages. Consequently a useful little treatise is considerably marred, either through not sufficient pains being bestowed upon its preparation, or owing to its author's ideas of our language not being precisely those to which one is accustomed.

Notwithstanding this, however, the book contains a good deal of really useful information. Various methods of ascertaining the stresses on different kinds of lattice girders are given, and are applied, by way of illustration, to such structures as the new Tay Bridge, the single-line railway bridge over the Spey at Elgin, which has a clear span of 360 ft., and others.

The author also explains how to ascertain the stresses in continuous girders, suspension bridges, and arches, under all practical conditions of loading, and describes how a rivetted joint should be designed, besides alluding to several other important matters of detail.

It will be seen therefore that the book covers a wide field, and the subjects with which it deals are throughout treated in a much more practical manner than generally is the case in works of this character, and this alone is sufficient to recommend it to a large number of those interested in designing bridge-work.

The Law Relating to Building. By His Honour Judge EMDEN, assisted by H. JOHNSTON, Barrister. Third Edition. London: Knight & Co. 1895.

JUDGE EMDEN has acted wisely in compressing this work in size: it now consists of 690 pages as against 947 pages in the second edition. On the other hand, the paper and print are not so good as they were in previous editions. There is little to be said of this edition, since the previous issues have received full notice at our hands. We may repeat that this is a full and comprehensive work, wanting in some respects even yet in compression. It would have been the better, too, for a less wholesale quoting of cases in the notes, and a little more care not to put the word "supra" after a decision which is printed in full on a previous page, and not on the page on which this word appears. We have also some doubt whether it was desirable to print in this volume the London Building Act, 1894, which has been the subject of separate works. This book relates rather to the general law in relation to buildings, such as the relations between the architect and his employer. The person who desires to possess such a work, and is not concerned with London buildings, may well hesitate to purchase a book which contains a number of pages occupied by statutes relating only to London. But even with certain drawbacks, there is no doubt that this book is a complete storehouse of the law relating to buildings, and, though clumsy in form, contains a great quantity of useful material more useful to

the lawyer, as it is presented in this book, than to the layman.

Archæologia Oxoniensis. Part VI. Oxford: 116, High-street. London: Henry Frowde.

THE Oxford Archæologia increases in size and interest as its proceeds. The sixth number contains an account, with an illustration, of a very interesting piece of carving of the thirteenth century, a spandrel, believed to have been part of the base of the shrine of St. Frideswide. An article on the architecture of the Bodleian Library gives some letters of Sir Thomas Bodley, which indicate that he was to some extent directing the work himself: for example—

"I pray you send me by your next Monday carrier how many foot you find between the wall of the Divinity School just by the door, and the wall without next the gate. Likewise between the side wall of the School and the wall that does compass the School next to the Town wall. Take your measure from the wall of the School, and not from the Buttresses."

In another letter—

"I am sorry for Bennett, whose skill I shall want in many respects. But yet my trust is in Bolton, that he will make it good, bearing as he doth so good a report, of sufficiency in his joinery. I pray you send me word, how soon you think it will be, before they finish all, to the end," I may take order with the painters to begin."

There is an order, too, as to the doors to the library, Sir Thomas thinking it "an exorbitant request" to have a door made towards Exeter College, when there was already a door at the west end of the library. But it all does not seem to amount to more than that be ordered how the walls were to stand or where there was to be a door. For the detail of the work he seems to have trusted to "Bolton" and others.

National Art Library, South Kensington: Classified Catalogue of Printed Books. Ceramics.

We should have said "classified" catalogue, but the "Department" never uses the English of ordinary mortals. The present is the first of a series of such catalogues which are to be issued, with the view of enabling every reader to ascertain with the least possible trouble what works the Art Library contains on any particular branch of art. In addition to the titles of books and pamphlets specially relating to the subject, these catalogues will contain the titles of others which incidentally illustrate it, with a reference to the page or plate to which attention should be directed.

Such catalogues will be of the greatest service to students, and save them a great deal of time and trouble. We only wish the British Museum would attempt something of the same kind.

Correspondence.

To the Editor of THE BUILDER.

PROPOSED ASSOCIATION OF WATERWORKS' ENGINEERS.

SIR,—We are again reminded by that useful directory published by Messrs. Hazell, Watson, & Viney, that "there is no institution wholly given up to water engineering questions in England, although such questions are occasionally treated of by the Institution of Civil Engineers." That is, I am led to understand, the opinion of many engineers, managers, and others interested in waterworks undertakings. The exceptional and severe winter of 1894-5 itself was a subject-lesson to those interested in waterworks. The controversy between the use of two-gallon and three-gallon cisterns for water-closet purposes, the question of employment of registered plumbers only for waterworks purposes, the better control of fittings for the prevention of waste, misuse, and the contamination of public supplies, are points amongst others which might usefully engage the attention and call for combined action from those engaged in this important branch of engineering.

My object in writing is to initiate a discussion from those interested, with a view of ascertaining what support is likely to be given to such an association.

D. M. F. GASKIN, Engineer.
Nottingham Corporation Waterworks,
Engineer's Department,
November 16, 1895.

* The punctuation seems to be given as in the original letters.

The Student's Column.

METALS USED IN BUILDING.—XXI.

DURABILITY.

THE action of the weather on metals is widely different to that on stone or wood, though the effects may often appear to be somewhat similar. There are so many different kinds of metals and they are called upon to fulfil such a variety of functions that it is impossible to adequately discuss, in the scope of a series of articles like the present, their behaviour under all circumstances. We can only go into the matter on general lines.

A metal that is insufficiently supplied with oxygen, or whose nature it is to absorb that element on every convenient occasion, is usually a most perishable substance unless it is suitably protected. The commonest of all metals—cast and wrought iron and steel—are specially prone to succumb to atmospheric influences, owing to the great affinity iron has for oxygen. The production of iron-rust and scaling is the result. The process of decay may be arrested or facilitated, as the case may be, according to the composition and excellence of manufacture of the iron and steel, and the situation and conditions in which the metals are placed. In a humid atmosphere, or under water, such metals are placed to the worst advantage—the drier the air the better, provided it is fairly pure and not too much impregnated with deleterious acids tending to corrode. The composition of the water is all important, and the conditions as to temperature are leading factors.

It is generally stated that the quantity of rain annually falling in a district may in some measure be taken to indicate the potential energy of the weather with respect to metals in such district. Now, although that is within certain limits perfectly correct as applied to building stones, it must only be taken to apply to metals to a very slight extent. The rainfall of a district is measured directly by means of a gauge attached to the receptacle into which the rain falls, the proportion falling over a wide area being estimated therefrom. But, suppose the whole of the year's rain were to fall in, say, sixty days instead of being spread more evenly over the year, we could allow a fall of 100 inches in the former case, and that would not do so much damage to unprotected iron as would twenty-five inches in the latter. In reality, it is not so much the amount of directly measurable rain that constitutes the important factor, as the prevalence of dew. The most work is accomplished when the surface of the metal is continually kept moist, and dew cannot be placed in the same category as rain. The corroding power of the dew and rain is enormously increased near the sea-board.

By way of illustration, it may be remarked that the telegraph wires on some lines seem unaffected by twenty years' exposure; whilst in other situations the total renewal of the wires has become necessary on the expiration of three or four years—and that with the same material. The varying durability of galvanised zinc roofs in different localities is well known. The life of most metals, as previously remarked, depends chiefly on the resistance they offer to combination with oxygen, and thus their decay may be regarded as a slow combustion. Their durability further depends on the character of the oxide formed on their surface.

Wrought-iron in a pure, dry atmosphere suffers practically no deterioration; it is also extremely durable in distilled water free from air as far as possible; but it is slowly oxidised in a humid atmosphere, and with fatal rapidity in air or water containing free acids. It may, however, be efficiently protected from agents of destruction by paint of good quality, which adheres to clean iron with great tenacity. It is also a remarkable fact that its oxidation appears to be to a great extent arrested by vibration. Plates are more durable when united in large masses than when isolated. A singular instance of this occurred during the construction of the Britannia Bridge, as placed on record by Mr. Edwin Clark.* A heap of plates was left two years on the platform, where they became so corroded that they could be literally swept away with a broom; whilst precisely similar plates, employed in the construction of the tubes alongside, suffered no deterioration. From the foregoing it is evident that the painting of exposed wrought-iron girders and roofs, more especially in the neighbourhood of smoky towns, is a precaution

of the utmost importance. Every care should be taken to leave no unnecessary hollows where rain-water could collect, to avoid contact with damp earth, and especially with vegetation, and to use the material as far as possible in the form of heavy bars rather than thin plates.

In reference to iron-work for hot climates great care should be exercised in seeing that the surface of the iron is perfectly dry at the time of painting it. If this is not attended to, the high temperature and the moist state of the hold of the average vessel carrying such cargo tends to form rust underneath the paint; the latter rises in blisters, then bursts, and falls off in large flakes, exposing the bare iron, highly oxidised, without a vestige of the paint remaining. It is better, perhaps, not to paint iron-girders and the like for export in view of the difficulties adverted to; for it only entails expense in scraping the whole off, and commencing afresh.

In regard to the common practice of employing iron for structural purposes under water, it may be noted that on cast-iron being exposed to the action of sea-water it slowly decomposes; the iron being dissolved, leaving graphitic substances behind. The action, however, is superficial and very slow, and cast-iron piers have been built in the estuary of the Thames that have successfully resisted corrosive action for half-a-century and more. No doubt the action to a large extent depends on the quality of the iron. It is advisable to give a slight increase in thickness to plates used under water. In fresh water, cast-iron is not much affected.

We may now describe some experiments carried out by Mr. David Phillips, C.E., on the effects of various kinds of liquids, hot and cold, on iron, and the best means of preserving it under such conditions from corrosion.

The first series of experiments were conducted to show the effects on iron of various kinds of liquids, ranging in temperature daily, from that due to the atmosphere indoors, to the boiling-point. It was ascertained that hot fresh water acts less injuriously on iron than does hot sea-water; and the less frequently the water, fresh or salt, was changed, the less does the iron suffer from corrosion. On iron being coated with zinc, it was found that the zinc affords no protection in pure fresh-water, but in fresh water, with one-thirtieth of its volume of sea-water added weekly, it does afford protection to the iron; and that in fresh water mixed with about one-fourth of the proportion of chloride of sodium (common salt), sulphuric acid and chloride of magnesium contained in sea-water, zinc properly attached also protects iron, as well as in sea-water; but with this difference, that it is necessary, in order to prevent corrosion, to change the liquids every three months. Experiment showed further that chloride of sodium, even when double the quantity of that in sea-water was present in fresh water, neither acted on the iron nor assisted the zinc.

The second series of experiments had in view the effects on iron of various kinds of cold liquids indoors, and the best means of preserving it under such conditions from corrosion. With boiled distilled water in the open air, the corrosion was even and general, except at the ends, where it was much less severe, and in places scarcely affected. With rain the effects were similar, though not so severe, but with sea-water the corrosion was spread all over the surface of the iron, and crystals of the metal showed bright and sparkling. On sea-water, not in open air, being employed, the iron became slightly etched. The author gives much useful information on the action of other forms of water, and the loss in weight of each plate dealt with during a period extending over five years.

In dealing with the effects of small pieces of metals and other substances in contact with iron, or in its proximity, in cold sea-water Mr. Phillips found, amongst other things, that copper attached to a copper stay on iron became severely corroded, especially the top end round the stay, where the ferruginous metal was decayed into a groove one-third round the nut on each side.

In sea-water an iron structure often commences to decay round a nut or bolt. Considerable difference of opinion exists as to the relative durability of wrought and cast iron in the sea. Small wrought-iron rods have been known to withstand decay very well; these were about 1½ inch in diameter, standing ten or twelve feet out of the sand, and extended two miles from the shore into the sea, being frequently subjected to the action of heavy breakers. In this, and in other cases that might be cited, it would appear that a film

or "fur" formed upon the iron when it was round, but when there were square edges, polished surface, from abrasion of the metal, continually recurred, and fresh coatings of rust were formed, so that in time the angular bars perished.

The growth of animal and vegetable matter on iron structures in sea-water may promote decay or tend to preserve, depending on the class of organism or plant concerned. As an illustration, we may quote the observations of Mr. G. O. Mann† with reference to a bridge at the mouth of the river Ibura, in Brazil. At the time of the inspection the tide was very low, the bed of the river being nearly dry, so that the piles could be examined down to the sand. The whole of these were densely covered with oysters, from six inches to one foot in thickness, and the first ones had adhered so firmly to the piles, that on breaking the shells with a hammer, portions had to be chiselled from the iron to remove them. The piles were found to be perfectly sound; and it was clearly demonstrated that the shells in reality acted as preservatives to the metal by excluding both the air and sea-water.

In the case just mentioned the organism was a bivalve, the soft parts of which were never probably brought into contact with the iron, so that the active acids promoted by the animals were never directly applied to its surface. It is tolerably clear that with certain univalve shells that crawl over the surface and congregate in myriads a certain amount of destructive action is brought about.

Whilst dealing with the durability of ironwork though not altogether connected with atmospheric decay, we may briefly notice the recommendation of the Berlin Architects' Society.† To arrive at the probable duration of iron structures that bodies advised that observations should be systematically made, and amongst other things they should embrace the following:—1. Measurement of permanent deflection of parts of the iron structure; 2. Measurement of deflection under a load; 3. Enumeration of constructional pieces and rivets already repaired; 4. Examination of any existing looseness of the connexions at points of junction; and 5. Examination of the paint and any existing rusted places. Other, but special observations were suggested, and it was added that (a) for each structure a special observation book should be drawn up; (b) the general observations (1—5) should be repeated quarterly, and the special once a year; (c) observations, where possible, should be made by the same individual; (d) repairs to important parts of the structure, and the soundness of the material, as well as of the connexions, should be carefully inspected.

GENERAL BUILDING NEWS.

RESTORATION OF THE PARISH CHURCH, GREAT TOLLER, DORSETSHIRE.—The parish church of Great Toller has recently undergone restoration. It was decided, on the recommendation of the architect Mr. G. Gordon, London, to place the restoration of the old oak roof, or if found necessary the construction of a new one, in the hands of Mr. E. J. Wright, of London, who has since constructed a new oak roof (the old one having been found to be quite beyond repair). The work, as completed, consists in the removal of the south and west galleries and the opening up of the tower-arch, previously, like almost every other portion of the church, plastered over; the removal of the plaster from all the walls of these being now pointed with cement; the opening up of the old vestry arch, said by many to be of a Saxon date; the relaying of the floor; the construction of an entirely new roof to nave and south aisle in wainscot oak; the erection of arcades on the central shaft of Ham Hill stone to support the roof; the construction of a new pitch-pine loft in tower reached by a spiral iron staircase, and having an open tracery of ironwork spanning the tower arch; the replacement of the decayed flooring of tower; the removal of the west door to its original position; the overhauling of the exterior of the tower, replacing decayed stone with new, &c.; the placing of the ancient window, formerly in the east end of the chancel, to a position near the pulpit on the north side of nave; new seats throughout the church; pitch-pine; new oak choir-stalls and prayer-desk; chancel, and a new oak pulpit. The church has also been fitted with new lamps, supplied by Mr. Cox, Bridport. All the woodwork was executed by Mr. E. J. Wright, under the supervision of his foreman, Mr. Lee. The masonry was carried out by Mr. Thomas Legge. The new lead roof was supplied and worked by Mr. C. Cox, of Maiden Newton.

PREMISES, HIGH-STREET, KENSINGTON.—Messrs. John Barker & Co., Limited, are rebuilding

* "Min. Proc. Inst. C.E.," Vol. xxvii. (1868), p. 559.

† Consult "Min. Proc. Inst. C.E.," Vol. lxxv. (1885), p. 295.

* "Min. Proc. Inst. C.E.," Vol. xxiv. (1865), p. 6.
† "Mittheilungen des Sächsischen Ingenieur und Architekten Vereins," 1880, p. 145.

a large portion of their premises butting on to Ball-street. Mr. F. G. Vigor has prepared the drawings, and the company are carrying out all the work on their staff, with the exception of the fireproof floors, which are being constructed by Messrs. Mark Fawcett & Co. on the Mark Fawcett system.

STAFFORD COUNTY COUNCIL BUILDINGS.—In our account of this work in our issue of November 16, we omitted to mention that the marble work in the building was supplied by Messrs. J. & E. Goad, of Plymouth.

SCHOOLS, FARNHAM.—The second of the new schools built for the Farnham School Board was opened at Badsot Lea on the 9th inst. by Messrs. A. W. Chapman. The building is planned to accommodate 268 children. The elevation is of red sand-faced brick to the height of 4 ft. 6 in., and above this is finished in white Portland cement. The design is a tower at the angle, the site being a corner one. The architect is Mr. Paxton H. Watson, of London and Farnham; the contractor is Mr. G. Kemp, of Aldershot, and Mr. J. Church is clerk of works.

BOARD SCHOOL, WEDNESFIELD.—On Monday a new Board School was opened at Wednesfield. The new schools, which have been erected on a site facing the Neachell-road, near the Midland Railway Station, consist of a one-story block of building, having a mixed department, with schoolroom 48 ft. by 22 ft., and two class-rooms 24 ft. 8 in. by 24 ft. 6 in. and 25 ft. 3 in. by 20 ft. respectively. Also a class-room for 200 children. Also a separate infant school and class-room, making the total accommodation 300. The walls are of local red bricks, with terra-cotta dressings to the doorways and main gables. The floors are boarded, and the roofs are covered with Broseley tiles. The rooms are heated with open fireplaces. The general construction was carried out by Mr. Thomas Tildesley, builder, of Willeham, at a cost of 2,000. The site of the terra-cotta was supplied by Mr. Dennis, of Ruabon; the wrought-iron gates, railings, and gas fittings have been made by Messrs. Brawn, of Birmingham; and the desks and furniture by Messrs. Fisher & Son, of West Bromwich, and the whole has been under the personal supervision of Mr. T. H. Fleeming, architect, of Wolverhampton, whose design was selected in a competition by Mr. Robson, architect to the Education Department, who was appointed assessor.

CHURCH, BAMBER BRIDGE, LANCASHIRE.—On the 19th inst., the Bishop of Manchester (Dr. Moorhouse) consecrated the church of St. Aidan, Bamber Bridge. The portion of the church has been built at an outlay of about 4,000. It consists of chancel, north and south transepts, and side chapel, the two easternmost bays of nave, organ-chamber, and choir and clergy vestries, the west end having been left for future extension. The church, when complete, will consist of a wide and lofty nave with clerestory, the aisles being used as passages only. The transepts of good size, and the north chancel aisle is arranged as a chapel, the vestries and organ-chamber being placed on the south side of the chancel. The chancel is large and is well raised above the nave. The roofs have internal wagon-shaped ceilings, boarded, and with moulded ribs. The windows have traceried heads, and are filled with leaded glass, and set in geometrical designs. Externally, the building has been faced with Yorkshire stone parqu岸s, red Rainblin stone being used for all dressed work. The roofs are covered with north-country green slates, with red ridges, and the gable over chancel arch is surmounted by a bell turret. Internally, the walls generally are faced with red brick, but those to chancel are plastered. The woodwork throughout is of pitch-pine unvarnished. The portions now erected provide seating accommodation for 450 worshippers, which number will be increased to 800 when the church is completed. The style adopted is Late Decorated Gothic, and the building has been carried out from the designs, and under the superintendence, of Mr. R. Knill Freeman, of Bolton, and Manchester, whose design was selected in open competition. The contractors for the work were Messrs. Moore Brothers, of Rawtenstall; and Mr. J. Yates, of Bamber Bridge, has acted as clerk of works. The heating has been carried out by Mr. J. H. Mather, heating engineer, of Preston, and the lead-glazing by Messrs. Walsmley & Company, also of Preston.

ALMSHOUSES, WETHERSFIELD, ESSEX.—Some new almshouses have just been erected at Wethersfield, near Braintree, Essex. The site is in the main street of the village. The buildings consist of a range of four houses. The style of the buildings is Elizabethan, the facings being in red brick with stepped gables and tiled roofs. The bays are constructed of half timber work and have oak mullioned windows grouped in pattern leadwork. The verandah is supported by circular wood columns, rising from paneled stone pedestals. Mr. Alfred Brown, of Braintree, was the builder, and Mr. E. F. Bisschopp, of Ipswich, was the architect.

PARISH-ROOM, IPSWICH.—A new parish-room has been erected adjacent to St. Michael's Church, Ipswich. The site of the new buildings is at the south-east end of the church. The accommodation comprises a parish-room 30 ft. square, with scullery attached, and entrances with vestibules from Upper

Orwell-street and Bond-street, and a clergy vestry with door into the chancel. The parish-room has a height of 18 ft., with flat ceiling, divided by beams formed by the casings to the tie beams of the roof, with large octagonal inner light, which, with three large windows in the east wall, gives light. The floor is of wood blocks, and there is a platform at one end. The heating is performed by Musgrave stoves. The architecture is a form of Queen Anne. The whole of the work has been carried out from designs and under the supervision of Mr. E. F. Bisschopp, by Mr. William Grayston, builder.

SANITARY AND ENGINEERING NEWS.

THE EAST MOLESLEY DRAINAGE AND SEWAGE DISPOSAL WORKS.—On Saturday last, Mr. W. G. Garland, the Chairman of the East Molesey Drainage Committee, opened the East Molesey Drainage and Sewage Disposal Works. The East Molesey Drainage Scheme, which is now completed, was prepared by Mr. J. C. Melliss some thirteen years ago. It was not, however, until the year 1889, that any practical steps were taken in connexion with it. Many difficulties were met with, especially those raised by some of the Metropolitan water companies whose intakes are at West Molesey, and whose large water mains traverse the principal roads of East Molesey. This opposition was mainly with a view of protecting the Metropolitan water-supply from any risk of contamination, other difficulties were raised by some of the landowners, whose property was to be crossed by sewerage air-pipes. The East Molesey scheme embodies all modern improvements up to date, and includes land for filtration of the effluent water after chemical treatment. East Molesey is situated on the south or Surrey side of the river Thames, near to Hampton Court, and is traversed by the rivers Mole and Embury, which flow into the Thames at an area of 1,881 acres, with all rainfall and sub-soil water from the sewers and house-drains. The undertaking has been carried out in two contracts. The sewers, pumping station, tanks, buildings, &c., have been executed by Messrs. B. Cooke & Co., of Phoenix Wharf, Battersea, S.W., the amount of their contract being 24,300; and the machinery has been carried out by Messrs. Markham & Co., of Chesterfield, the amount of their contract being 3,984.

PORTLAND WATER SUPPLY.—The engineer, Mr. Ernest J. Elford, writes to us in regard to recent reports as to the bad quality of the Portland water supply, that the analyses of the water from the new well for upwards of a year gave the utmost satisfaction, and that it was only quite recently, after a prolonged period of heavy pumping, that salt water found its way into the well. Mr. Elford prepared a detailed report on the subject for the Urban District Council of the manor of Portland which he has forwarded to us. From this report it appears that in 1871 the Local Government Board pressed on the Portland Board of Health the urgent necessity of securing a better supply of water, but nothing was done till 1889, when the South-Well scheme was carried out, with the result above noticed. In the course of the Report it is mentioned that the Medical Directors General of both the Admiralty and War Department had condemned the use of Portland water for the troops and shipping, on account of the uncertainty of its quality. The objection to the water was not that it was always impure, or even generally impure, but that owing to the nature of the surroundings of the supply and of the strata through which it passes, it was rendered so liable to contamination that it must always be looked upon with suspicion. The Report confirms this opinion. Taking, as an instance, the well in Easton-square, a few minutes after a sharp shower the water was found to be in appearance much like milk. This was caused by the stone dust from the quarries; but was it not reasonable, says the engineer—nay, probable—that with such direct communication between the surface and the well as was proved by this fact to exist, other contamination might and did take place? Within a short distance were vaults and cesspools which had not been emptied for ten, twenty, thirty, and even more years. Could they be justified in recommending the use of a source of this kind for a permanent public supply? Apart even from the questions of quantity, cost, and quality, they had to face yet another consideration, viz., What would be the attitude of the Local Government Board towards the idea of a supply of this kind? The engineer thought they must all admit that it would be most unfavourable, and that they would probably place every obstacle possible in the way if an attempt could be made to carry out the scheme. Another idea, which found many supporters among the inhabitants of the Island, was the one of utilising in some way—either by sinking a large number of wells or by driving headings—the water from the Verne. The cost of this would be great, and both quantity and quality of water uncertain. Neither would it be advisable to bore deeper still, as this would necessitate boring right through the coral rag and Oxford clay (estimated to be about 350 ft. thick) into the cornbrash and forest marble, a total depth of probably 1,000 ft. Even then it would be doubtful whether they would obtain a satisfactory supply. Looking at the matter, therefore, all round, the

pits, liming apparatus, tip-truck, tramway, &c. 6. Coal-store, chemical-stores, mixing-vats, workmen's day-room, manager's office, fresh water-well, with steam-pump and overhead water-tanks in connexion therewith. 7. Three precipitation-tanks, containing together 270,000 gallons. 8. Eight acres of land, which have been suitably underdrained for filtration of the effluent water, which then passes by a culvert and is discharged into the River Embury. The chemical treatment will be similar to that already in use at Richmond and many other places, the salts of alumina and iron, together with a little carbon and a little lime, being dissolved in vats by means of water agitated by compressed air and then added to the sewage previous to its entering the precipitation-tanks. The supernatant water from the precipitation-tanks will be filtered through the land, which is of suitable quality, being of a sandy loam overlying gravel, and is underdrained to a depth of about 6 ft. The land will be used intermittently. The precipitate or sludge, which will gravitate from the tanks to a small underground chamber, will be limed and then pressed into a portable form. The air for working the Shone's Ejectors is compressed at the disposal works, and conveyed in one case a distance of 2,300 yds., and in the other a distance of 2,500 yds. to the ejector-chambers. These ejectors have been supplied and erected by Messrs. Hughes & Lancaster, of Ruabon and Westminster. The machinery throughout is provided in duplicate, so that the free flow of sewage and its purification will not be delayed at any time in case of temporary breakdown. The sewers and such parts of the works as cannot easily be targeted or added to are calculated and constructed to serve a future population of 15,000 persons. The disposal works which can be added to and enlarged without difficulty are calculated and constructed to deal with 50 per cent. more than the present population, or 7,500 persons. The scheme throughout is designed on the principle of excluding rainfall and sub-soil water from the sewers and house-drains. The undertaking has been carried out in two contracts. The sewers, pumping station, tanks, buildings, &c., have been executed by Messrs. B. Cooke & Co., of Phoenix Wharf, Battersea, S.W., the amount of their contract being 24,300; and the machinery has been carried out by Messrs. Markham & Co., of Chesterfield, the amount of their contract being 3,984.

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engineer could not recommend any source of supply upon the Island. He had come to the conclusion that the most available and satisfactory source of supply was one which was suggested some years ago—viz., the Portisham Spring. The chief advantages of this source were as follows:—(1) No experimental works would be required, the spring being an entirely natural formation. (2) The quality was no doubt excellent, as the water came direct from the chalk, and was entirely outside the influence of any possible contamination. (3) The level at which it could be obtained was such that the water would gravitate to such a height as to supply a very large portion of the Underhill District without any pumping; this would mean not only a reduction in the first cost, but also in the working expenses. (4) It would be less costly, taking everything into consideration, than any other. The cost of the whole scheme—including a supply-main from Portisham capable of delivering with the head available 300,000 gallons per 24 hours to a height of about 220 ft. above sea-level, engines, engine-house, reservoir, and distributing-main complete—would be estimated, amount to about 21,000*l.*, to which must be added an amount for compensation and law expenses, placed at 6,000*l.*, making a total of 27,000*l.* This amount for compensation would probably be much in excess of what they would have to pay, considering the very small use to which the water was at present put. The Portland Urban District Council have provisionally adopted this scheme, and have instructed their Clerk and the Engineer to take the necessary preliminary steps towards carrying it out.

SEWAGE WORKS, ALTON, HANTS.—A Local Government Board inquiry was held at Alton, Hants, on the 19th inst., by Col. Coke, M.Inst.C.E., for the purpose of considering an application from the Urban District Council for a loan of about 11,000*l.* for sewage disposal works, the plans of which had been prepared by Messrs. R. B. Grantham & Son, Northumberland Avenue. The inspector first examined the land up to and upon which the sewage was to be pumped and distributed, and then held the inquiry. There was a good deal of opposition to the application.

ARBORETH WATER SUPPLY.—At a meeting of Arbroath Burgh Commissioners on the 19th inst., it was resolved to extend the underground water supply of the town by sinking a new well in the lands of Warslap, and connecting it by means of an adit passing through the water-bearing gravel-bed with the wells and pumping-station at Nolt Loan. The adit connecting the wells will be about a quarter of a mile long. It was resolved to engage the services of Mr. McCulloch, of Messrs. A. & R. McCulloch, C.E., Edinburgh, and Messrs. McCulloch & Jamieson, C.E., Dundee, in advising the Board in the carrying out of the work.

FOREIGN AND COLONIAL.

FRANCE.—The special Railway Committee on means of transport for the Exhibition of 1900 has decided on the formation of a railway line from the Esplanade des Invalides to Versailles. The journey will occupy about twenty minutes. An interesting exhibition of water-colours and drawings by M. Hervier has been arranged at 20, Rue Laflitte, which will be open till December 12.—The Municipal Council of Paris has decided against the adoption of M. Teulière's scheme for metal foot-bridges over the streets.—The monument to Emile Augier the poet was inaugurated last Sunday at the Place de l'Odéon. The stele which supports the bust is connected with the pedestal by a bronze seat on which is seated a woman in rich Renaissance costume, personifying the Clorinde of "L'Aventurée." She turns towards a figure symbolising Comedy, who is engraving the name of Augier on the stele. Behind the monument is a small genius or child leaning against a mask which recalls the features of the actor Got, who was one of the principal interpreters of Augier's works. The figures, as we have previously mentioned, are the work of M. Barrias.—The heirs of the Comte de Paris have redeemed the estates of their father, notably the Château d'Eau and its domain, which represents a value of five million francs. The Château d'Amboise has been purchased by the Duc d'Anjou, who proposes to use this ancient abode of the French kings as a *maison de retraite* for veterans of the war in Africa.

—A statue to Pasteur is to be erected at Melun, by public subscription.—At Vesinet, near Paris, a very large building or group of buildings was inaugurated last Sunday, combining a general-post-office, schools, barracks, and municipal buildings.—A monument has been erected at Blois, a few days ago, to the memory of the historian Thierry. M. Iselein is the sculptor.—The Municipality of Neuilly-sur-Seine has opened an architectural competition for the erection of new Law Courts.—The next Congress of the Association for the Advancement of Science will be held at Tunis, from the 1st to the 4th of April, 1896, and will afford opportunity for some very interesting visits which have been arranged to localities in the neighbourhood.—A number of members of the Municipal Council of Charenton-Saint-Maurice have taken steps towards providing for the erection of a monument to Delacroix, the painter, who was born there.—Important decorative work is proposed to be carried

out at several of the Mairies in the outskirts of Paris, especially Issy, Suresnes, and Creteil.

GERMANY.—The picture presented by the Emperor to the Czar of Russia has now been published as an etching. The author is Herr H. Knackfuss, who worked under the Emperor's personal supervision, and if we are rightly informed, partly from a rough sketch provided by His Majesty illustrating his ideas as to the composition.—The election of Herr Kinzel to be President of the Akademie für Bauwesen has been ratified. Professor Adler will be Chairman of the Architectural Section. These elections hold good until 1898.—Dresden is to have a monument to commemorate the Royal festivities of 1889, when the anniversary of the House of Wettin was celebrated. The monument will be in the form of a large bronze obelisk about 60 ft. high, with historical bas-reliefs. The design is by Messrs. Schilling & Gräbener, architects, of Dresden, and the site selected is opposite the Prince's Palace.—Professor Karl Begas, of Cassel, has been awarded the first premium for the design of a monument illustrating German unity. Professor Eberlein received the second premium.—The competition for laying out the Pleissburg site at Leipzig, to which we have referred, has been won by an architectural student, Herr Thimig. The premium was 150*l.*, and there were twenty-five candidates.

—Some fine Roman mosaic work has been found at Treves, and has been restored.—Some excellent Roman mosaic work was also found at Bingen, on the Rhine, and has been sold to the Frankfurt Museum.—The archaeological collections of Münster, which are valued at 9,000*l.*, have been presented to the Province of Westphalia, which is founding a provincial museum.—"The History of the Steam Engine" is the subject of the new premium of the Society of German Engineers; the essay is to treat of the last fifty years, and of the progress in different countries. The premium is 500*l.*, and the essays are to be sent in by December 31, 1898.—The Berlin municipality advertises for a "director" for the city gas-works. As several municipal offices, such as the management of the waterworks, have been held by Englishmen, it may be of interest to note that the salary is 750*l.*—A new building for the electro-technical institute at Hanover has been opened.—The owners of property in the suburbs of Berlin are opposing the purchase of ground for cemeteries.—"Baurath" Hugo Licht, the city architect at Leipzig, has received a distinction from the Emperor in connexion with the ceremonies at the new Imperial Law Courts.—The Pathological Institute at Berlin will now be temporarily lighted by electricity, and the new buildings taken in hand.—Professor Roch's Bacteriological Institute which was erected some time back (and which was temporarily housed in barracks opposite the large Government hospital), will be transferred to Dahlem, where new buildings will be erected for it.—Berlin is to have a Colonial Institute, arranged on similar lines to our institution in Northumberland-avenue. Temporary premises have been taken, and a new building is soon to be erected by voluntary contributions.—The General Council of next year's National Exhibition has not approved of the recommendations of the Committee of Management with regard to lighting the galleries at night, and this decision is causing much discussion in the Press throughout Germany. Demonstrations are being held by clerks, workmen, and others, who are employed throughout the exhibition, demanding the regular lighting of the exhibits after dark.

SWITZERLAND.—A monument in memory of the assistance given by the Swiss to the city of Strasbourg during the Franco-German war has been unveiled at Basle. The monument cost 15,000*l.*, and is the gift of Baron Gruyer. Herr Bortholds is the sculptor.—The new "Tonhalle" has been opened at Zurich with some ceremony. The block is practically what we understand under the name of a people's palace, and contains several large assembly rooms, concert halls, with dining-rooms, refreshment-rooms, and suites of rooms which can be let out for private entertainment. The situation is on one of the main embankments facing the Zurich Lake, with a most beautiful aspect. Messrs. Fellner & Helmer, of Vienna, are the architects. The main hall will seat 1,500 for concerts, with an orchestra of eighty and a chorus of 350. The second hall holds 1,000, and the third about 600. The acoustic properties of the halls are considered very satisfactory.

BOMBAY AND CENTRAL INDIA RAILWAY STATION.—Mr. E. Roscoe Mullins, sculptor, has been commissioned to execute in Bath stone, the colossal group of sculpture representing "Engineering," to be placed on the central gable of the Bombay, Baroda, and Central India Railway, Administrative Offices, Bombay, of which Mr. F. W. Stevens is the architect. Mr. Mullins has also been commissioned to execute the medallion heads of the late Colonels French and Kennedy, the pioneers of the railway company, to be placed in circular piers over the minor arches of the central carriage porch of the building.

MISCELLANEOUS.

OAK SCREEN, ST. MATTHEW'S CHURCH, IPSWICH.—An oak screen has been presented to St. Matthew's Church, Ipswich, by Mrs. D. H. Booth in memory of her late husband. This

structure, which is of light oak, has been designed by Mr. John S. Corder, of Ipswich. The screen is placed between the two impostes of the chancel-arch. It is 12 ft. 9 in. high from the chancel floor to the top of the cresting, and has a width of 14 ft. 4 in., the upper portion being wider owing to the fact that the piers of the chancel-arch spread at the top by reason of an ancient settlement. The screen is divided into seven bays or compartments, the centre one being much wider than the others and forming the doorway. The six bays flanking the doorway are filled in solid to about 3 ft. 8 in. from floor with oak panels having carved and traceried enrichments in the upper part of the panels and standing upon a solid moulded plinth. Above these panels rise moulded mullions, the four principal ones having buttresses on the two faces, and these buttresses terminate at the spring of the arches with crocketed pinnacles. The screen is carved and enriched on both sides, and every panel, spandrel, and crocket is of different design. The devices on the four shields to the chancel side are the emblems of the Crucifixion. All the angels vary in design and vesture. There are 102 different spandrels, 97 different crockets, 15 different finials, and 66 different carved cusps. The design was carried out by Mr. Fred. Bennett, builder, Ipswich, the carving being executed by Mr. John Groom.

THE MONUMENTAL BRASS SOCIETY.—This Society was reconstituted nearly two years ago out of the former "Cambridge University Association of Brass Collectors." The total number of members was 144 in June of this year. Two parts of the "Transactions," and two parts of the Portfolio, were published during the past year, and the attention of members is called to the fact that matter for the "Transactions" is urgently needed, and the editors will be glad to receive any papers, lists, or notes suitable for publication thereon. An excellent list of Bedfordshire brasses continues to run through the "Transactions." It has been decided to publish the Cambridgeshire list in a similar form; considerable progress has been made in the final revision of this work, and a large number of matrices and inscriptions, omitted in the old list, have now been added.

"DICKENS'S LONDON."—A justly-merited rebuke has lately been given to one of the numerous class whose enthusiastic worship of what they call "Dickens's London" sometimes outruns discretion. A correspondent of the *Times*, having gratuitously assumed the truth of a tradition that No. 18, Took's-court, Curator-street, is "the identical house which Dickens had in his mind's eye" as that of Snagsby's law-stationer and scribe, goes on to say: "Snagsby's house is very old, and is likely soon to be demolished; those interested should not delay in seeing it." Whereupon Mr. J. A. Langston writes thence to the *Times* representing that to his own knowledge a large sum of money has been recently expended upon the property, and adds: "As one carrying on my profession of an architect at this address, I do not want those who know me to imagine I am living in a tumbledown old structure; whether it be Dickens's Snagsby's house or not."

OPEN SPACES, LONDON.—It is stated in *Notes and Queries* that the chief officer of the Parks Department, London County Council, is engaged upon a history of Municipal Parks and Open Spaces in London. On the 5th inst. Lord Meath opened to the public Bartholomew-square, E.C., acquired by the St. Luke's Vestry, through the instrumentality of the Metropolitan Public Gardens Association, who at their last monthly meeting, agreed to contribute to the purchase of the disused burial-ground at Guy's Hospital, to acquire a burial-ground in Long-lane, Bermondsey, and to improve the enclosure around St. John's Church, in Smith-square, Westminster.

OXFORD UNIVERSITY BRASS RUBBING SOCIETY.—This society has a two-fold object; during term, to complete and revise the register, first of all brasses, then of all sepulchral monuments in the county and diocese of Oxford; and, during vacation, to promote the study and preservation of brasses elsewhere, as its members may find opportunity. The society has held two ordinary meetings, in each of the last three terms, at all of which recent rubbings taken by members have been exhibited. Papers have been read on "Symbolism in Brasses," by H. M. Conacher; "The Problems of a Brass Engraver," by J. W. Crowfoot; "Heraldry," by A. R. Pinel; "Canopies in Brasses," by J. L. Myres; "The Parish Church and Monuments of Minster in Sheppy," by W. H. Draper. At a public meeting held in the Ashmolean Lecture Room (Viscount Dillon gave a lecture upon "Ancient Armour," and has since been elected an honorary member of the society. The President is the Rev. J. C. Cox, LL.D., F.S.A.

RESTORATION OF A CROSS, LUSCOMBE, DEVONSHIRE.—Two miles or so south-west of Totnes, in the hamlet of Luscombe and parish of Harberton, at the junction of four roads, are the fifteenth-century remains of a cross. Only the base and part of the upright pillar have remained to testify to what was once there. These are hewn out of grey granite. Under the direction of Mr. W. M. Tollit, architect, of Totnes, the missing portions have now been made good. The new work is of Dartmoor granite, and on the top of the shaft is a circular head carved like that of the cross at St. Columba's

Major. The restoration has been carried out by Messrs. Harry Hems & Sons, of Exeter.

THE STRAND EXPLOSION.—The inquiry into the circumstances attending the death of Fireman Sprague was resumed on Monday, at the St. Clement Danes Vestry Hall, by Mr. John Troutbeck, the Westminster Coroner.—Mr. A. O. Collard, architect, of Buckingham-street, Strand, deposed that he was instructed by Sir J. Hutton, in February, 1893, to make a survey of the houses, and made out a specification for every necessary repair. He had viewed the *debris* since the accident, and found that the houses were well built. The gas-main opposite No. 27 was found to be fractured. There had been a leakage from the main, and he had no doubt that the gas percolated into the basement of No. 26, where it would accumulate owing to the cellar being sealed up. That was the cause of the explosion.—Mr. Rowland Plumbe, District Surveyor of West Hamstead, gave similar evidence.—Mr. Robert Walker, District Surveyor of St. Martin's-in-the-Fields, also stated that the houses were in good condition. He was of opinion that the accident was due to an explosion caused by the gas getting into the cellars. The main and old buildings were never properly separated. In both houses all the flues were cracked.—P. Watson, a turncock in the employ of the New River Company, said that on October 24, five days before the explosion, he visited the court. The fracture in the water-pipe was about 20 ft. from the afterwards damaged gas-main, and eight inches above it. There was apparently an escape of gas, and he tested the pipe with a taper all along the trench which was made. Failing to detect an escape he did not make a report to the gas company. He thought then it must be sewer gas.—Mr. George F. Foulger, chief engineer to the Gas Light and Coke Company, deposed that the gas-main was cracked, and that the court had been made before October 28. The gas-main was practically unsupported by earth, and acted as a girder to the footway above. The fracture of the gas-main was due to the falling of the building, and it had previously, in his opinion, been cracked by the weighing away of the soil beneath it. He was certain that the crack was of recent date, because a serious escape of gas as it would have permitted could not have gone on undiscovered for any length of time.—Charles Hartwell, an inspector of gas-mains, stated that he made a fourth attempt to find an escape of gas on the evening of Tuesday, about five o'clock, and found there was some leakage. He made out his report at 6.45 p.m., and shortly afterwards heard that an explosion had occurred, so that there had not been time to take remedial measures.—Sir Frederick Bramwell, past-President of the Institute of Civil Engineers, said, in reply to Mr. Lyttelton, that he had inspected the scene of the disaster, and found a considerable depression in the ground, which had existed before the fall of the houses, but which the weight of the *debris* would increase. The earth below the asphalt had been carried away, and the soil underneath the gas-pipe was charged with water and too loose to afford good support for the pipe. There had evidently been a leakage of water. He found no trace of a long-existing crack in the gas-pipe. The rust was due to the crack being exposed to the water. The gas-main was strong, well laid, and in good condition. Other evidence having been given, the jury returned a verdict of "Accidental death," but were not agreed upon a rider.

FOREST GATE AND UPTON PARK.—Messrs. Tuckett & Son offered by auction at the Princess Alice Hotel, Romford-road, on the 19th inst., a further portion (being their twelfth sale) of the Plasheet Hall Estate, belonging to the trustees of the late John Gurney; comprising sixty-one lots in South Esk-road, which realised from 51*l.* 10*s.* to 71*l.* 10*s.* per lot, and fifteen shop lots in Red Post-lane, which made from 90*l.* 10*s.* to 100*l.* 10*s.* per lot. The whole of the seventy-six lots were sold for a total of nearly 5,000*l.*; a result showing a considerable rise in values, consequent upon the rapid development of the neighbourhood.

NEW PULLMAN VESTIBULE TRAIN.—A train of three new Pullman cars has recently commenced working on the Brighton Railway. The vestibules of these cars are larger than any previously built, and two of the cars have each a private room to seat six passengers. These rooms are finished in satinwood, with ceilings painted and decorated in gold to match the upholstery, which is of crimson plush, with crimson silk curtains lined with gold. All the cars are fitted both for compressed oil-gas and for electric light, and are heated by means of hot-water apparatus. Electric communicators are conveniently placed throughout to enable passengers to summon the conductors when required. The cars have been constructed and finished for the Pullman Company

at the works of the Brighton Railway Company at Brighton.

THE COMMISSIONERS OF SEWERS.—At the meeting of the Commissioners of Sewers held on Tuesday last a report was presented by the Streets Committee recommending the adoption of certain modifications in the plans of the Central London Railway Company and the Waterloo and City Railway Company and the rejection of other proposed modifications. The proposed modification No. 2, which would substitute the subway terminus in front of the Mansion House contemplated by the scheme of the Central London Railway for the terminus in front of the Royal Exchange which the scheme of the Waterloo and City Railway included, was recommended on the ground that it would better distribute the general traffic through the whole system of subways than the original plan. It would not affect the sewers under the control of the Commissioners, but it would involve an alteration of the levels and direction of the Walbrook sewer, which was under the control of the London County Council. Both the railway companies concurred in the proposed alterations. The main alterations proposed were Nos. 3, 4, and 5, the first of which proposed alterations at the corner of Princes-street and Mansion House-street, to avoid interfering with the vaults of the Union Bank, which the engineers now found would be done if the original plans were carried out. The proposed alteration would involve a further extension of the carriage and footways, and a reduction in the size of the refuge in the centre of the road-way, and the Committee regarded this as highly objectionable. Modification No. 4 proposed a single staircase instead of a double one at the east side of the Mansion House, but the Committee's report insisted on the retention of the double staircase according to the original plans. It was recommended that before permission was given for the commencement of any of the works, the Central London Railway Company be required to satisfy the Commissioners as to their ability in all respects to complete the proposed station subways and approaches in accordance with the provisions of that company's Act of 1869.

LOCK-MAKING AND LOCK-BREAKING.—On the 16th inst., at the Goldsmiths' Institute, New Cross, Mr. H. W. Chubb delivered a lecture on "Locks." Having dealt with his subject historically, and shown designs of German and Italian workmanship, he caused to be thrown on the screen a series of views, among the most formidable automats that are to be met with on this side of the Atlantic. Nitro-glycerine having been poured into keyholes, and locks thereby blasted, the expedient has been adopted of a door that has no hole or chink of any sort on its face. Then how, it would be asked, was the lock turned? As could be seen from one of Mr. Chubb's views, the key is constructed of two wheels, springs on the inner side of the door, which will only open at a time that was appointed when it was shut.

MAGAZINES AND REVIEWS.—We are asked to mention that the new periodical, the *Auto-Car*, referred to under the above heading as a monthly, is in fact a weekly publication, and the *Engineering Magazine*, mentioned under the same heading as "of New York," has its London agency at the offices of the *Electrician* in Salisbury-court, Fleet-street, where it can be purchased without sending an order to New York.

LECTURE, TREVALGA CHURCH, CORNWALL.—An eagle lectern, carved in English oak, has just been placed in this church. The parish church is dedicated to St. Petrock. The new lectern has its base supported by ornamental and traceried buttresses, carved at their junction to the central stem. The amulet of the latter is also boldly carved. Messrs. Harry Hems & Sons, of Exeter, carried out the work.

THE COLSTON STATUE, BRISTOL.—The statue of Edward Colston, which has been erected in the centre of St. Augustine's open space, was unveiled by the Mayor of Bristol (Mr. W. Howell Davies) on the 13th inst. The commission for the work was placed in the hands of Mr. John Cassidy, of Manchester. The base of the statue and the pedestal stand from it are of Hoptonwood stone. The pedestal stands to ft. 6 in. above the pavement, and the stonework is relieved by the bronze dolphins at its corners, and by the tablets fixed to its faces. The statue is 8 ft. 8 in. in height, and Colston is represented attired in the dress of the period, with flowing wig, coat of velvet, vest of satin, and knee-breeches. The statue and the panels are in bronze, and were cast by the Coalbrookdale Company, the whole being placed in position by Messrs. W. Cowlin & Son, of Bristol.

THE REGULATION OF SHELTERS.—In a report to the Marylebone Vestry, which has been adopted by that body, Dr. Wynter Blyth, the Medical Officer of Health for the Parish of St. Marylebone, says that "the Board of Works for the Whitechapel District, the Guardians for Wandsworth and Clapham, and the Vestry of St. Margaret and St. John,

Westminster, have severally passed resolutions to the effect that it is desirable that shelters should be placed under the Common Lodging-Houses Acts. These Acts lay down strict regulations as regards cubic space, closet accommodation, cleanliness, the separation of the sexes, and for the immediate notification of infectious disease. The Common Lodging Houses Acts were in London, until quite recently, carried out by the police, but now, by a Local Government Order, the provisions are carried out by the London County Council, who employ for that purpose a special staff of inspectors. I am quite of opinion that shelters should be placed under stricter regulations than it is possible to enforce at present, but I object in principle to a central authority carrying out the details of inspection, considering that the functions of such central authority should be limited to duties of general supervision, questions of main drainage, of water-supply, the direction and dimensions of new streets, the promulgation of by-laws, and so forth. To extend their powers in matters of strictly local detail will, in practice, be found to act in a wasteful and inefficient manner. I would, therefore, suggest to the Committee that it might be reported to the Vestry that it is advisable to place shelter under strict regulations, and that for this purpose a Bill giving the power to the London County Council to make by-laws for their better regulation, such by-laws to be carried into effect by the several Local Authorities, would be desirable and should meet with the approval of the Vestry.

ALTERATIONS AT THE OPERA COMIQUE.—The Opera Comique, now under the direction of Miss Nellie Farren, has undergone some internal structural alterations which bring it more into line with modern ideas of theatre construction. The old balcony has been entirely removed and a spacious and airy pit, with well-raised floor, has been substituted, encroaching so much towards the stage, as to leave only five rows of stalls. These latter, however, have been extended laterally by the removal of two of the stage-boxes. The old pit circle on the first tier has been advanced towards the proscenium, and by the use of cantilevers of steel, supported on circular columns forms the new dress circle. The decoration does not call for special comment, being of the ordinary type. Messrs. Patman & Fotheringham have carried out the works under the superintendence of Messrs. Fowler & Hall.

AUTOMATIC FLUSH-TANKS FOR TROUGH-CLOSETS.—In dealing historically with closets in his lecture on sanitary appliances on Wednesday evening at the Carpenters' Hall, London Wall, Professor A. Wynter Blyth said that, in his opinion, the automatic flush-tank for trough-closets should not be used strictly as an automatic flush, but that it should be started by hand, otherwise there was a great waste of water with a minimum of effect. When in operation, at a school, for instance, it was required only at certain times of the day, just before or just after school hours, when a large amount of excreta had to be dealt with, and when it should be started by an attendant. At night and when the closets were not in use there was no need for the tank to be in action.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The third meeting of the Session of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, on the 20th inst., at 7 p.m. The proceedings were an entire departure from precedent, taking the form of a "Symposium of Recent Inventions." The Chairman, Mr. Herbert A. Satchell, opened the meeting in a brief introductory and explanatory speech. Short papers were then read upon the following subjects by representatives of manufacturing firms:—1. Impervious Surfaces, suitable for Exterior Work; 2. Hard Wall Facings for Interior Work, Special Plasters, &c.; 3. Fittings and Attachments for Windows; 4. The Latest in Closets. The firms personally represented were Messrs. Doulton & Co., W. B. Simpson & Sons, the Adamant Co., Jos. Robinson & Co., and Mr. Robert Adams. Illustrative samples were sent by the Fireproof Construction Co. and the N. A. P. Window Co. The members then discussed the various specialities before them, with the advantage of being able to directly question the manufacturers upon points of special interest. At the conclusion of a very useful meeting, hearty votes of thanks were passed to the firms who had contributed to the success of the evening.

MEMORIAL CHURCH, BERLIN.—Messrs. Campbell, Smith, & Co., ask us to mention that they carried out the stained glass windows in this church, having the commission for them in competition with German and French firms. We have little doubt, considering the types of stained glass generally in favour in France and Germany, that this was to the advantage of the artistic effect of the building.

RICHMOND HILL.—The Richmond Corporation and the Dysart Trustees have practically come to terms, and the public need have no further occasion to indulge in alarming prophecies with respect to the celebrated view from Richmond Hill. Under the new arrangement between the Trustees and the Corporation, Petersham Meadows will henceforth be dedicated to the use and enjoyment of the public; and, subject to the consent of the Court of Chancery, the pretty wooded slope at the back of the "Star and Garter," will also become the property of the Corporation. These are the chief points in the

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Deadens to be delivered.
*Rebuilding Infirmary	Manchester Royal Infirmary	20l. each	Nov. 30
*Public Baths	Lincoln Corp.	.....	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Schools, near Derby	Erasington Sch. Bd.	G. M. Conlson	Nov. 25
*Erection of Infants' Hospital	East Grinstead U.D.C.	W. W. Goss	Nov. 28
Roadmaking and Paving Works	Willesden D.C.	G. Claude Johnson	do.
Flaps, Kerbs, &c. (Basingstoke Stone)	Bury Leane Corp.	J. Cartwright	do.
Additions &c. to H. Spital	Cardiff Corporation	R. J. Snel	do.
Station, &c. Trade street	Belmont U.D.C.	Y. and Mackenzie	Official
Additions to W. R. House	Leamington U.D.C.	.....	do.
Goods Shed and Office, Darwen	Leamington U.D.C.	.....	do.
Paving 1 pier North street	Leamington U.D.C.	.....	do.
Brewing River Tuff	Leamington U.D.C.	.....	do.
Paving, &c. Wicks Lane, near R. H. H.	Leamington U.D.C.	.....	do.
Waterworks, Longhoughton, Ireland	Leamington U.D.C.	.....	do.
Sheds, &c. Padrick Grove, Boston	Leamington U.D.C.	.....	do.
Schools, Quay road	Leamington U.D.C.	.....	do.
Colleges and Offices, Lark, co. Dublin	Leamington U.D.C.	.....	do.
Street Works, Derwent road	Leamington U.D.C.	.....	do.
Sewering, Mills Hill road	Leamington U.D.C.	.....	do.
Pipe Sewer, &c.	Leamington U.D.C.	.....	do.
Road Works, Pine Street	Leamington U.D.C.	.....	do.
Two Semi-detached Villas, D. and B.	Leamington U.D.C.	.....	do.
Ireland	Leamington U.D.C.	.....	do.
Seven Houses, Mount Street, R. H. H.	Leamington U.D.C.	.....	do.
Sortling Office	Leamington U.D.C.	.....	do.
Additions to School, Dudley road	Leamington U.D.C.	.....	do.
House at Pumping Station, R. H. H.	Leamington U.D.C.	.....	do.
*Ere.ing Paving House	Leamington U.D.C.	.....	do.
Footbridge, Ford, near Brook Farm,	Leamington U.D.C.	.....	do.
Paving and Kerling Works	Leamington U.D.C.	.....	do.
Four Houses, Allerton, York	Leamington U.D.C.	.....	do.
Additions, &c. to Mar. Castle, Braemar	Leamington U.D.C.	.....	do.
Iron Footbridge over River Browney	Leamington U.D.C.	.....	do.
School, Bow Br. Hill	Leamington U.D.C.	.....	do.
Laying Sewer in Leigh road	Leamington U.D.C.	.....	do.
Wood Paving	Leamington U.D.C.	.....	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Water Tower, Bartley Green, near Birmingham	King's Norton R.D.C.	R. Godfrey	Dec.
*Repairs and Materials, Guildford	W. Department	Official	do.
*Construction of River Walls	Vestry of Rotherhithe	Official	do.
Additions, &c. to Schools, Treleair	Bewdley School Bd.	James & Morgan	do.
*Erection of Bankruptcy Office, Manchester	Com. of H. M. Works	Mr. Pien	Dec. 3
*Construction of Siphoning Tanks, &c.	Sutton, in - Ashfield, U.D.C.	Official	do.
*Kerling, Tar Paving, &c.	Lewisham Bd. of Wks.	Official	do.
School and House	Corwen (Wales) School Board	J. D. Denby	do.
Schools, Ampfield, near Romsey	Yatelydow Sch. Bd.	J. Rees	do.
Church, Anghebra, K. Derry, Ireland	Rev. J. McGillicuddy	E. J. Ture	Dec. 5
*Making Patent Tiles for Fireproof Floors	A. D. Dansey, Esq.	Official	do.
*Supply of New and Purchase of Old Stores	London on Trent Union	R. Stevenson	Dec. 7
*Erection of Boiler House, &c.	Paddington Gunpowder	Official	Dec. 10
*Repairs to W. R. House	Streets - Council	Official	do.
Wood Pavements	Town U.D.C.	M. W. Davies	Dec. 11
Sewer and Outfall, Aberdovey, Wales	Manxfield Corporation	G. & F. Hodson	Dec. 13
Erection of Pumping Station	Water Works	Rees Corporation	Dec. 14
*Construction of Railway	L. & S. & C. Ry. Co.	W. & S. & Thackeray	Dec. 15
Lodging House, Darwen, Lancs.	Amble U.D.C.	Official	do.
Waterworks, Hazon and Morwick	H. B. Davies	R. Walker	No date
Alfreds to Business Premises, Windsor	F. Smith	J. G. Stallabas	do.
Edwards Cottages, Morris-street, Peterborough	O. E. Smeeth	Official	do.
Four Houses, Apple Tree Cerr, Barnley .....	.....	.....	do.
Two Flats, Semi-detached Villas, Beeston, Nottingham .....	.....	.....	do.
Refrigerating Plant, in St. Stanford-street, Ash - under Layer .....	.....	.....	do.
Road Works, Crantborne road, Alton .....	.....	.....	do.
T. & Pairs Semi-detached Villas, West Bradford, N. York .....	.....	.....	do.
Villa, Hall road, Ekehill, York .....	.....	.....	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works	Poplar Board of Works	2l. 10s. per week	Nov. 26
*Engineer	Gartland R.D.C. .....	.....	Nov. 27
*Resident Engineer and Clerk of Works	Portsmouth U.D.C.	3l. 10s. weekly	Nov. 30

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv., vi., viii., & xviii. Public Appointments, p. xvi.

settlement of a dispute which at one time threatened to assume a very angry complexion, and which might have terminated in a manner disappointing to all admirers of one of the finest landscape views in the world.

LEGAL.

A QUESTION OF LIGHT AND AIR AT PLYMOUTH.

BEFORE his Honour Judge Edge at Stonehouse, on the 11th inst., Richard Pearce, owner of a house at 11, Prospect-place, Plymouth, claimed 50l. damages from William Laphorn, contractor, Plymouth, for erecting a workshop upon a wall alleged to belong solely to plaintiff, and thus causing an obstruction to light and air. Plaintiff also asked for an injunction to restrain defendant from continuing the trespass and obstruction.

Mr. R. R. Rodd, jun., for plaintiff; Mr. P. T. Pearce (instructed by Wilson & Love) for defendant.

Mr. Rodd said plaintiff was the executor of his father, who was possessed of 11, Prospect-place by deeds dated 1826. The wall was plaintiff's. Defendant had erected a workshop on the wall, with the result that necessary air and light to plaintiff's premises were seriously interfered with. Although notice was given defendant not to continue to build on the wall he had done so. Plaintiff's tenants had been many of them in the house for nearly twenty years, and all objected to the obstruction. The building was of corrugated iron and wood, and doubtless could be removed at no great expense.

Messrs. A. W. Debnam, E. M. Lees, & H. G. Luff (architects and surveyors), and plaintiff bore out counsel's statement, and Messrs. Austin, Bursleigh, John Gill, and Mrs. Sowden spoke of the baneful effect upon the light and air in the rooms and courtyard.

Mr. J. Teague gave similar evidence. A wall at right-angles to the one in dispute belonged to him, and he had forced defendant to take down part of his building. He had called upon Mr. Pearce more than once to repair the wall, and Mr. Pearce had done so.

For the defence Mr. Pearce called Mr. A. Corderoy, who gave his reasons for considering the wall a party-wall. With regard to air, there were 248 superficial feet of air in the courtyard, which was 220 superficial feet in area, before defendant put up his building. There were now 172 superficial feet of air; amply sufficient, the usual expert allowance being 6 in. for every superficial foot of courtyard. The erection had rather increased than decreased the current of air, on the

mine principle that a higher funnel increased draught. With regard to the light, he failed to see how the erection could make any appreciable difference. The sun would have to shine due north to cast a shadow on Mr. Pearce's property, and even if it did, the effect would be very small.

Cross-examined, witness asserted that the evidence of the tenants was largely nonsense, and added that he had proved that scientifically. His honour deferred judgment.—*Western Morning News.*

MEETINGS.

FRIDAY, NOVEMBER 22.

Architectural Association.—Dr. G. B. Longstaff, L.C.C., on "The Municipal Control of Buildings." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Charles Mason on "Scavenging, Disposal of House Refuse." 8 p.m.

SATURDAY, NOVEMBER 23.

Builders' Clerks' Institution of Great Britain.—Meeting in Room 13 of the Westminster Town Hall, Caxton-street. 6 p.m.

SUNDAY, NOVEMBER 24.

Sunday Lecture Society (St. George's Hall, Langham-place).—Mr. Wyke Bayliss on "The Use of the Supernatural in Art." 4 p.m.

MONDAY, NOVEMBER 25.

Surveyors' Institution.—Mr. R. M. D. Saunders on "Landlords and Tenants in Ireland." 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. P. Fitzgerald, M.A., on "Robert Adam and his Style." 7.30 p.m.

TUESDAY, NOVEMBER 26.

Institution of Civil Engineers.—Paper to be further discussed:—"The City and South London Railway; Subaqueous Tunneling by Shells and Compressed Air;" by Mr. J. H. Greathouse. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor H. Robinson on "Sewerage and Sewage Disposal." 8 p.m. Postponed from Tuesday, November 19.

WEDNESDAY, NOVEMBER 27.

Carpenters' Hall, London Wall (Lectures on Building and Sanitary Construction).—Mr. James Bartlett on "Setting Out Work and By-laws." 8 p.m.

Society of Arts.—Mr. H. H. Cunyngame on "Locomotive Carriages for Common Roads." 8 p.m.

Liverpool Engineering Society.—Mr. Arthur Musker on "Artificial Paving Slabs." 8 p.m.

THURSDAY, NOVEMBER 28.

Society of Antiquaries.—8.30 p.m.

Dramatic Engineers.—(1) Mr. F. Bathurst on "The Electric Wiring Question"; (2) Mr. S. Mavor on "Concentric Wiring." 8 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

19,574.—WINDOWS: *W. Youlten.*—Apertures are made in the boxed frame of sliding sash windows, which admit air when the window is closed, the current being regulated by a hit-and-miss ventilator, opened and closed by a handle and rod.

20,695.—WATER-CLOSETS: *F. Wells.*—For providing a well-ventilated closet, a box is moulded on the outside of the earthenware bowl of the closet, and divided into two chambers, the upper one of which receives the water-supply and delivers it into the flushing rim; the other is connected with a ventilator and the interior of the closet-bowl, by this means leading away any objectionable smell.

22,297.—WINDOWS: *A. Barr.*—For swivelling windows, sashes into apartments a rod is passed through a number of eyes fixed in alignment to the frame and sash. The window may then be turned as a pivot. Catches are used for locking the upper and lower sashes together so that both may turn on the same hinge.

23,469.—WATER-CLOSETS: *J. Tennant.*—Flushing apparatus for water-closets and the like, comprising a cistern provided with a vertical flushing-pipe open at the top and fitted with an external flange, and a hood furnished with float and arranged to surround the open end of the flushing-pipe. Space is left between the pipe and floating hood for the passage of water between the two, the arrangement being such that upon the latter being caused to quickly move downwards by means of a lever, water within it and above the flange will be forced into the flushing-pipe and the flush started.

23,793.—CASEMENTS: *W. Youlten.*—A casement is hinged upon centres or pivots to the frame in such a manner that it may either swing inwards or outwards. Between the abutting surfaces of all the sides of the casement frame, suitable weather check devices are provided.

24,946.—KILNS: *G. Warren.*—Relates to a kiln provided with three chambers at different heights, and connected to the different chambers by short flues. The object is to promote combustion, and to utilise the waste heat from chambers which are cooling, for drying unburnt bricks or other articles in other chambers.

4,184.—VENTILATOR: *F. Barker.*—Ventilator for causing an up-draught, consists of a vertical foul-air shaft or chamber, with or without internal divisions, and having one or more air provisions near the upper end, communicating with the adjacent outer chamber. One or more outer chambers are formed by enclosing the shaft with casings at a suitable radial distance, such chambers being provided with internal divisions, and having outlet openings, each outlet being protected by a baffle-plate. The whole is surmounted by a suitable cap.

NEW APPLICATIONS FOR LETTERS PATENT.

NOVEMBER 4.—20,774, W. Bryan, Preventing Waste of Water and Pipes Freezing and Bursting.—20,781, M. Adams and C. G. Garry, Fitting for Sash-windows.

NOVEMBER 5.—20,840, O. Steed, junior, Water-taps and Valves.—20,852, A. Brown and H. Price, Ventilators.—20,863, J. Shanks, junior, Ships' Water-closets.—20,883, J. de Lara Colaba and A. Dell, Enclosing Draught and Rain.—20,892, J. Thompson, Fireproof Walls or Partitions.—20,900, W. Turton, Fire and other Bricks.

LONDON.—For carrying out works at the Edward-street Transferred School, Deptford, with a view to adapting the building for the purposes of a special school, and also for the accommodation of girls and infants, for the School Board for London. Mr. T. J. Bailey, Architect.—

A. Buck & Son.....	£460	E. Proctor.....	£300
Mid-Kent Building and Contracting Works, Ltd.....	437	J. Kiddie & Son, Northampton.....	298
J. & C. Bowers.....	354	Folgate.....	247
W. Akers & Co.....	399		

* Recommended for acceptance by the Works Committee.

LONDON.—For erecting a school for special instruction in connection with the Bath-street School, City-road, to accommodate 60 children, and for erecting a new cooly centre and for other works for the School Board for London. Mr. T. J. Bailey, Architect.—

N. Ludstone.....	£3,343	0	0	W. M. Dabbs.....	£2,812	0	0
McCormick & Sons.....	2,651	0	0	E. Lawrence & Sons.....	2,750	0	0
Kilby & Gayford.....	3,095	0	0	George Munday & Son.....	2,712	6	3
W. Shurmut.....	2,866	0	0	W. A. King & Co.....	2,729	0	0
Dove Bros.....	2,567	0	0	Treasure & Son.....	2,723	0	0
C. S. S. Williams & Son.....	2,854	0	0	Johnston & Co.....	2,707	0	0
Staines & Son.....	2,837	0	0	Charles Cox, Hackney.....	2,643	0	0

* Recommended for acceptance by the Works Committee.

LONDON.—For the construction of a brick-sewer, &c., Cornwall-road, for the Vestry of St. Mary Abbots, Kensington.

Wimpey & Co.....	£2,300	Revel & Robson.....	£1,345
C. Bell.....	1,250	C. W. Killick & Co.....	1,436
A. Kellert.....	1,780	R. Ballard.....	1,319
T. Adams.....	1,678	E. Rogers & Co., Ltd.....	1,310
J. Meers.....	1,548	W. A. King & Co., Ltd.....	1,293
Wm. Neave.....	1,483	W. A. King & Co., Ltd.....	1,293

* Accepted.

LONDON.—For providing and fixing a complete system of low-pressure hot-water apparatus for warming the first portion of a school on the site in Bailey's-lane, South Tottenham, to provide accommodation for 39 children, for the School Board for London. Mr. T. J. Bailey, Architect.—

J. Gibbs & Son.....	£483	16	8	T. Green & Son, Ltd.....	£399	0	0
Stigante & Son.....	126	0	0	J. Devoes & Son, Ltd.....	337	0	0
J. Richardson & Co.....	433	0	0	J. C. & J. S. Ellis, Ltd.....	311	0	0
C. Davis.....	350	0	0	J. Fraser & Son, Ltd.....	384	0	0
Jones & Atwood.....	322	0	0	Wall Rother Works.....	404	0	0

* Recommended for acceptance by the Works Committee.

LONDON.—For providing additional heating surface to improve the efficiency of the existing low-pressure hot-water apparatus at the Enfield-road School, Le Beauvoir Town, for the School Board for London.

W. G. Cannon & Sons.....	£116	0	0	J. Fraser & Son.....	£184	0	0
Duffield & Co.....	19	12	0	Vaughan & Brown, Ltd.....	19	12	0
Fraser & Fraser, Ltd.....	101	0	0	Kirby-street.....	147	0	0
Reid & Co.....	176	0	0	Wentner & Son.....	146	18	0
J. F. Clarke & Sons.....	183	0	0	& Co.....	146	18	0

* Recommended for acceptance by the Works Committee.

LONDON.—For the erection of two temporary iron buildings, Salisbury-row, Walworth, for the School Board for London. Mr. T. J. Bailey, Architect.—

Hill & Smith.....	£1,443	0	0	W. Mathew.....	£1,315	15	0
M. T. Shaw & Co.....	1,315	0	0	Rumpley, Ltd.....	1,197	0	0
T. Cluysen.....	1,338	0	0	I. Dixon & Co.....	1,197	0	0
E. C. & J. Keay, Ltd.....	1,254	0	0	Cragg & Co., Ltd.....	1,150	0	0
D. Chatteris.....	1,214	19	0	Upper Thames-st.....	1,150	0	0
J. Lysaght, Ltd.....	1,230	0	0				

* Recommended for acceptance by the Works Committee.

LONDON.—For providing and fixing a complete system of low-pressure hot-water apparatus for warming the West-end School, Shepherd's Walk, Hoxton, for the School Board for London.

Tomer, Clegg & Co.....	£1,415	0	0	W. G. Cannon & Sons.....	£93	0	0
Simole & Co.....	603	0	0	J. F. Clarke & Sons.....	593	0	0
W. G. Cannon & Sons.....	681	0	0	J. F. Clarke & Sons.....	593	0	0
Jones & Atwood.....	603	0	0	Moorgate-street.....	593	0	0
J. Devoes & Son, Ltd.....	615	0	0				

* Recommended for acceptance by the Works Committee.

LONDON.—For providing additional heating surface to improve the efficiency of the present system of low-pressure hot-water apparatus at the Heller-road School, East Dulwich, for the School Board for London.

W. G. Cannon & Sons.....	£240	10	0	J. C. & J. S. Ellis, Ltd.....	£127	0	0
J. Fraser & Son.....	230	0	0	J. F. Clarke & Sons.....	122	0	0
Matthews & Yates, Ltd.....	210	10	0	J. Womner-Smith, Ltd.....	99	10	0
Wenham & Watson, Ltd.....	199	10	0	Gray & Co., Finsbury-pavement.....	99	10	0

* Recommended for acceptance by the Works Committee.

MARVULTER (N.R.).—For additions to school-buildings (West Schoolhouse). Messrs. Ellis & Wilson, architects, 181, Cannon-street, Aberdeen. Quantities by architects.—

Marvulter—John Shaw, Marvulter, Aberdeen.....	£350
Carpentry—Jas. Troup, Marvulter, Aberdeen.....	
Slatting—Wm. Miller, Aberdeen.....	
Plastering—Jas. Simpson.....	
Painting—Wm. Horne.....	
Painting—Jas. Garvie & Son, Aberdeen.....	

MILTON-NEXT-SITTINGBOURNE.—For the supply of 240 tons Guernsey granite broken, also 25 tons granite chips, for the T. B. District Council. Mr. A. B. Acworth, Surveyor, Milton.—

Le Maître, Alderney.....	S. d.	5	d.
W. Sommerfeld.....	10	11	0
Lyon & Co.....	10	11	0
Mowlem & Co.....	11	8	9
W. Griffiths.....	11	30	0
A. & F. Manuelle.....	12	3	0
Tricker & Sons.....	12	3	0
Parham & Son.....	12	9	0
Fennings.....	12	9	0

* Accepted.

MIRFIELD (Yorks.).—Accepted for rebuilding the "Pear Tree" Inn, for Messrs. S. Webster & Sons, Ltd. Messrs. Jackson & Fox, architects, 25, George-street, Halifax.

Decorating and Masonry—W. & J. Milner, Mirfield.....	£393	2
Plumbing—Wm. Halliwell, Brighouse.....	180	0
Painting—R. P. Stafford, Halifax.....	75	0
Slatting and Plastering—Sam. Johnson & Sons.....	275	0
Painting—J. Brocombe, Mirfield.....	13	5

MORLEY (Yorks.).—For the erection of four houses, Dartmouth-avenue, High-street, for Mrs. B. Lohley. Mr. T. A. Buttery, architect, Queen-street, Morley.—

Plumbing—J. & J. Sugden, Morley.....	£375	0
Plastering—J. Hogg.....	25	0
Painting—E. Wilson, Morley.....	25	0
Shingling—Sharp & Harpell, Leeds.....	26	10
Painting—A. Francis, Morley.....	21	5

MITCHAM.—For the construction of a new length of low-level sewer, for the Crofton Rural District Council. Mr. Robt. M. Chart, F.S.I., Surveyor, Union Bank Chambers, Crofton, and Mitcham. Quantities by Messrs. Franklin & Andrews, 25, Ludgate-hill, London.—

W. Langridge.....	£9,109	0	0	W. Waley.....	£1,875	0	0
King.....	1,053	0	0	E. H. Hines.....	1,245	0	0
Free & Sons.....	1,601	0	0	H. Lee.....	1,159	10	4
G. Bell.....	1,475	0	0	S. Hudson, Street.....			
J. Kavanagh.....	1,350	0	0	ham Hall.....	1,011	17	10

* Accepted subject to execution of bond.

NANTWICH.—Accepted for the supply of c.i. pipes, branches, &c., for Bulkeley water-supply (Contract No. 1), for the Rural District Council. Mr. J. A. Davenport, engineer, 125, Hospital-street, Nantwich. Quantities by engineer.—

Cochrane & Co., Woodside New Works, near Dudley.....	2 1/2 pipes, 3 1/2 pipes, 4 1/2 pipes, 5 1/2 pipes, 6 1/2 pipes.
Per ton.....	Per ton.....
£1 10 0.....	£1 17 6.....
£1 10 0.....	£1 17 6.....

Blakenough & Son, Brighthelm, Yorkshire (for fittings).

NANTWICH.—For the execution of water-supply works, Bulkeley, Contract No. 2, for the Rural District Council. Mr. John Aldersey Davenport, C.E., engineer. Quantities by engineer.—

John Phoenix.....	£586	1	11	Wm. Lythgoe.....	£248	0	0
John Eason.....	385	1	6	Henry Dodd.....	241	12	0
A. H. Hulce.....	270	8	0	Sam Wood.....	217	10	0
Wm. Shingler.....	271	8	4	J. P. Grady, Wallasey.....			
John Matthews.....	255	0	0	ton, near Nantwich.....	203	13	0

* Accepted.

NEWENT (Gloucestershire).—For the Newent extensions, Gloucester Corporation Waterworks. Revised tenders for Contract No. 5: engines, pumps, and boilers (two sets of machinery and three boilers).—

Hunter & English.....	£10,351	0	0
Heming & Ferguson.....	10	10	0
D. Stewart & Co., Limited.....	10	10	0
Yates & Thom.....	7740	0	0
The Glenfield Co., Limited.....	6285	10	0
The Littlehall Co., Limited.....	6047	10	0
W. Wallis & Co.....	6740	0	0
Goddard, Massey, & Warner.....	5569	7	6
Humphidge, Halliwell, & Co., Limited.....	5564	0	0
R. Moreland & Son.....	5905	10	0
A. Barclay, Sons, & Co.....	5305	0	0
Summers & Scott, Gloucester (acceptors).....	5214	10	0

NEWTON ABBOT.—For the erection of farm buildings, Stubbins Farm, Upwell, for Mr. D. R. Scraton. Messrs. Kendall & Symons, F.S.I., Surveyors, Newton Abbot. Quantities by surveyors.—

Frank Pearce.....	£113	0	0	Parker Bros.....	£676	0	0
Frank Zealley.....	604	0	0	H. Mills, Newton Abbot.....	555	13	0

[Surveyors' estimate, £679 10s.]
* Accepted.

PORTSMOUTH.—For the erection of hospital and nurses home, for the Guardians of Portsea Island Union. Mr. C. W. Bevis, architect, Elm-grove Chambers, Vandonough-road, Southsea. Quantities by Mr. C. W. Bevis, Southsea.—

W. J. Chichester.....	£1,193	0	0	Sungbirds Bros.....	£2,094	0	0
J. Cricknell.....	21,579	0	0	Clark & Son.....	19,483	0	0
R. Jones.....	21,291	0	0	W. W. Evans, Southsea.....	19,330	0	0
J. H. Cooke.....	21,291	0	0				

* Accepted.

SOUTHEND-ON-SEA.—Accepted, on schedule of prices, for providing and laying 8,000 ft. Tees iron pipe channeling and other works for the Corporation. Mr. Harold Harlock, Borough Surveyor, Clarence-road, Southend.—

M. W. Buxton, Prittlewell, Southend-on-Sea.

VENTNOR.—Accepted for fitting up buffet at the Royal Marine Hotel, Ventnor, Isle of Wight, for Messrs. Bush & Judd, proprietors.

H. & F. Warner.....	£250
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[No competition.]

WASHINGTON (Durham).—For the erection of a house, also additional school buildings, for the School Board for Durham. Mr. Robt. Hudson, Jun., £2,563 0 0; Robinson & Hunter, £2,199 8 8; G. H. Hodgson..... 2,550 0 0; Thomas Hunter..... 2,195 14 10; Isaac Oates..... 2,331 9 0; J. & R. Thornton..... 2,070 0 0; M. R. Draper & Sons..... 2,275 14 6; John Kelly..... 2,077 18 8; J. B. Stott..... 2,228 19 10; Chas. Graves..... 2,000 0 0.

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WOBURN SANDS (Beds.).—For building offices, for Messrs. Down & Needham.—

Geo. E. Fathers, Bedford (accepted).....	£295
--	------

WOLVERHAMPTON.—Accepted for the erection of house and shop, Colman-street, for Miss S. Rogers. Mr. J. Mason, architect, Victoria Chambers, Bilston-street, Wolverhampton.—

Henj. Guest.....	£310
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VOL. LXIX. No. 9756.

NOVEMBER 30 1896.

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A Country House: the Hall.—Messrs. Baillie Scott and Seton Morris, Architects	Double-Page Ink-Photo.
Offices, Moorgate Court, and 123, Cannon-street, E.C.—Mr. H. Huntley Gordon, Architect	Double-Page Ink-Photo.
Chantry of Abbot Ramryge, St. Albans Cathedral.—Measured and Drawn by Mr. P. Rider Smith	Two Single-Page Photo-Litho's.

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The Early Records of Wells Cathedral.*



Of the majority of those who have visited the Cathedral cities of England, Wells will probably have a prominent place in the memory, both for the beauty of its buildings, and its position at the foot of the Mendips. Like Chichester and Hereford, Wells was a foundation of Secular Canons, and much of the disturbing element in the history of its growth was due to the rivalry between it and the monastic institutions of Bath and Glastonbury.

For many years the documentary evidence relating to the Cathedral lay in the library, and the Registry of the Chapter is described as "a mass of parchments almost wholly without arrangement and in various stages of preservation" by the Historical MSS. Commission in 1870. Ten years later they were examined by Mr. W. de Gray Birch, cleaned and catalogued, and some of these documents, together with one in the Archbishop's Library at Lambeth Palace, entitled "Ordinale et Statuta Ecclesie Cathedralis Wellensis," were given by Mr. E. Reynolds in his work on Wells Cathedral. A few years more saw a complete cataloguing by the late Rev. J. A. Bennett of all "The Registers, Rolls, and Adventure Books," published by the Historical MSS. Commission in 1885. Such is the general outline of the introductory note given by Canon Church in his work on the "Early History of the Church of Wells"—a work dealing with the history of the fabric, and the doings of its Chapter, from the early days of Giso to the middle of the fourteenth century, covering perhaps the most interesting period in the rise of the Chapter and the Church. Canon Church has here brought together in an extended form, papers originally contributed to "Archæologia" on Bishops Reginald, Savaric, Jocelin, and Roger, with additional chapters on the time of Bishop Robert, the Chapter of Wells in the latter part of the thirteenth and the

early part of the fourteenth centuries, and an account of the arrangement of the Church at that period, drawn from the documents already referred to, and others, and from the evidence given by the building itself.

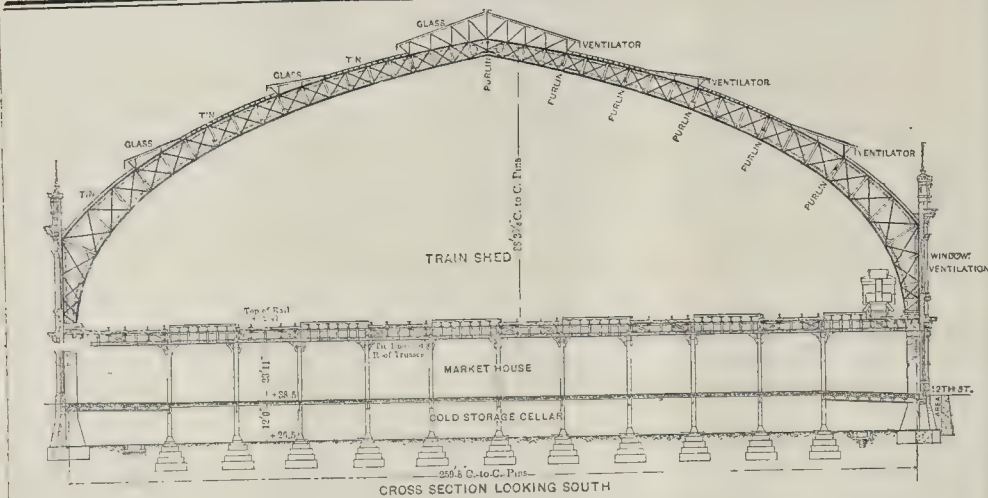
In his early pages Canon Church traces the growth of the Cathedral Chapter during the eleventh and twelfth centuries, and adds, "from henceforth gradually the Canons of the Cathedral Church became a distinct corporation, with a head in the person of the Dean, at first appointed by the Bishop, soon afterwards chosen by the Canons. All the Canons and dignitaries were appointed by the Bishop. But whereas hitherto the Bishop had been the head of his Canons, as an Abbot was the head of his Monks, now by degrees the Chapter became a separate body, with interests and possessions of its own, distinct from those of the Bishop—a corporate body entitled the 'Dean and Chapter,' to whom was committed the home government of the Cathedral Church." We have in the pages that follow what record there is of the rebuilding of the church by Bishop Robert (1136-1166), "the starting-point for all inquiries into the architectural history of the present church." Nothing remains of the Saxon church at Wells, or of anything which would be likely to date before the latter portion of the twelfth century, and unless the design was much advanced for its date, the consecration of the building in 1148 could hardly refer to any part of the present building. In this we must rather agree with the late Professor Freeman when he said that "whatever was built in the days of Robert has utterly vanished." Perhaps the clearest evidence of this is to be seen in the north porch of the Cathedral, with its curious ornament, so strongly resembling the work of the *vetusta ecclesia* at Glastonbury Abbey, more generally known as St. Joseph's Chapel, which was not dedicated until St. Barnabas' Day, 1186, by Bishop Reginald, the successor of Robert, being the first portion rebuilt of the Abbey Church after the great fire of 1184. In his chapter on Reginald, Canon Church conclusively proves from documentary evidence that building operations of importance were being carried out during his episcopate, grants appearing "ad constructionem novi operis," mention being made of repairs to the chapel of St. Mary, and a grant by Nicholas de Barrow "in consideration of the Conserva-

tion of the Canons of Wells, and the admirable structure of the rising church," and thus refutes the theory advanced by the Canon of Wells and Godwin, "that nothing was done between Robert's and Jocelin's time." Other reasons are given in support of this. Reginald was a "vigorous man, a Norman, and might be supposed to have had that love of building which distinguished the race." His travels, and his knowledge of other works, which were going on at the time, both at home—at the great Abbey of Glastonbury, across the moor six miles away—and abroad, "in his uncle's diocese of Coutances," would all be likely to stimulate his desire of continuing the work at his own fabric at Wells during his episcopate (1174-1191). The present church, too, shows good evidence of this period when the so-called "Early English" style had not completely thrown off the stiffer forms and ornament of the Norman period, but had begun to show signs of the fuller development which took place in the following century.

Savaric followed Reginald, and "his worldly and eccentric career is a strange interlude between the decorous and beneficent episcopate of his predecessor and that of Bishop Jocelin his successor." The Abbey of Glastonbury was by him annexed to the see of Bath "by a circuitous and bold intrigue," which "forms one of the ecclesiastical events which throw light on the relations of Church and State at the time just preceding the Great Charter." It will not be surprising to those who read this interesting chapter on Savaric that but little if anything was done to the building of the church by him, and we pass on to his successor Jocelin of Wells, 1206-1242, known as Jocelin Trotteman, during whose time the ascendancy of Wells was continued, and building operations, both at the Cathedral and its surrounding buildings—the Palace and the Canon's houses—were carried on.

"Between the years 1206-1242 Bishop Jocelin repaired, enlarged, completed, and consecrated the church anew," but he was an exile from 1208 to 1213, and the completion of work was necessarily delayed until after his return. With regard to the documentary evidence of Jocelin's work, Canon Church says, "We are disappointed at finding so little."

* "Chapters in the Early History of the Church of Wells." By Rev. C. M. Church, M.A., F.S.A. London: Elliot Stock. Taunton: Barnicott & Pearce.



Section of Broad-street Station, Philadelphia and Reading Railway, U.S.A.

Jocelin died November 19, 1242, at which time the cathedral church was finished, and the burial-grounds at the west, south-west, and south-east, for the lay burials, Canons, and Vicars respectively, were arranged. To this period belongs the celebrated west front, with its fully-developed Early English features and its valuable statuary, and some pages are devoted in the book under notice to the architectural differences between this west front and the earlier detail of the nave and transepts.

The fifth chapter is devoted to Roger of Salisbury, 1244-47, whose episcopate is "short but memorable in the annals of the Church of Wells." It was in his time that the long controversy between Bath and Wells was brought to a close by mandate from Pope Innocent; and the Bishop took the style of "Bath and Wells," elected by the Monks of Bath and the Canons of Wells alternately, and so continued until the dissolution of the community at Bath left Wells, "the sole seat of the Bishop," although the double title is retained at the present day.

In a succeeding chapter Canon Church traces the growth of the Chapter at Wells from 1242-1333, and the building operations which, from the year 1286, "went on for at least fifty years," the result of the more secure condition of the finances of the community. To this period is assigned the building of the beautiful octagonal chapter-house, so notable a feature in eastern views of the church, a worthy record in itself of the rise of the Cathedral Chapter, standing on a basement of earlier date. The stairs and approach from the transept are suggested as the work of Bishop Burnell, 1275-1292—the builder of the chapel at the Palace—and the completion of the Chapter-house itself as that of Wm. de la Marchia (whose beautiful tombs stand against the south wall of the transept, and whose canonisation was so urgently but unsuccessfully desired) and Dean Godley, 1305-1332, his successor, who finished it, and to whom we "owe the preservation of early Chapter documents, and the formation of the first of the Chapter Registers, the Liber Albus, in the Chapter archives." During this period also the central tower was raised and roofed, the Lady Chapel built, the extension of the choir was made and refitted, and the parapet round the whole of the earlier church was renewed. A concluding chapter deals with the interior arrangement of the church, and with reference to this and the state of the fabric at this time, a detailed ground-plan is given forming a frontispiece to the work. This

shows clearly the state of the church in that intermediate period before the eastern half of the presbytery, as we see it now, was completed, and joined to the earlier presbytery on the west and the Lady Chapel of Dean Godley on the east. In the appendices that follow, a great deal of documentary evidence is given in full, and also an account of the discoveries recently made immediately east of the cloister and south of the transept. The foundations of an early and a late chapel were opened up—the former only of which comes within the scope of the present work—and a plan showing this early chapel is given. The work throughout is illustrated with photographs of seals, some drawings of tombs in the Cathedral, a representation of a pastoral staff discovered some years ago in the precincts, and an excellent photograph from the south-east of the Cathedral itself.

In a work of this kind it is difficult to be critical. Much that might, in less able hands, have been "dry" reading, has been used by Canon Church to give a vivid and highly-interesting account of the historical events, not only in Wells itself, but in Europe, as they affected Wells and other ecclesiastical centres, and his pages are full of evidence bearing on the fabric and its architectural history which will be valuable to all those who take an interest in our Cathedrals, and wish to arrive at a closer understanding of the various portions, the periods at which they were built, their uses, and the events, sometimes peaceful and prosperous, at others troublous and full of jealousies and intrigues, which were characteristic not only of the greater communities of the Middle Ages, but also of the smaller. The book will take a foremost place amongst the valuable records of our Cathedrals, written as it is by one who knows the subject better than any other living authority; and although it is perhaps documentary rather than architectural, enough will have been said in this notice to commend the work to those who wish to supplement the detail of the architectural portion of the fabric with the no less necessary knowledge of the doings of the times which caused the buildings themselves to be erected.

A LARGE AMERICAN RAILWAY STATION.

ALTHOUGH in America it is customary to apply the term "train shed" to the most important part of a large railway station, yet engineers in this country will

consider that a building containing three lines of way, and one capable of dealing with the arrival and departure of no less than 300 trains a day, is a structure of more importance than its American name suggests to English ears.

As a matter of fact the building which has recently been constructed by the Philadelphia and Reading Railway Company was, when first built, the largest single span station in the world, although now it is compelled to rank as second, owing to the construction of Broad-street Station of the Pennsylvania Railway in the same city. This latter station has a roof over the platforms, 100 ft. 8 in. span, 100 ft. in height at the centre, and 598 ft. in length: while the one about to be described has only a span of 255 ft. 8 in., is 88 ft. in height at the centre, and has a total length of 652 ft. 6 in., and is consequently a little larger than the St. Pancras Station of the Midland Railway Company, the roof of which has a span of 240 ft. and a length of 600 ft. Although these are the largest station roofs that have been constructed, they have been eclipsed in point of size in some buildings as the Machinery Hall at the Paris Exhibition, which had a span of less than 364 ft. 2 in., and by a somewhat similar building at the recent Chicago Exhibition, the roof of which was 368 ft. span.

A corner site was selected by the Philadelphia and Reading Railway Company for their new station, having a frontage of 260 ft. and a depth of 663 ft. A number of preliminary sketches and designs were prepared by the engineers and architects, and after careful consideration it was decided to adopt the Italian Renaissance type of architecture for the station building. This building, the total height of which is 170 ft., consists of a cellar, basement, and practically eight stories, the second and third stories being merged into one high story in that portion of the second floor occupied by the waiting-rooms.

The level of the railway being about 2 ft. above the street required the principal floor of the station to be placed in the second story, the first or ground floor being available for the entrance, waiting-rooms, ticket offices, luggage-rooms, &c. It having been decided to establish the general offices of the company at the station, certain portions of the first floor, not otherwise required, all the floors above the second story, can be appropriated for this purpose.

The exterior faces of the building on street fronts are constructed of pink Easton granite for the height of the basement first-story, and above that of pink brick cream and white terra-cotta. For a por-

of the work Gustavino flooring is used, and above the second-floor a slow-burning construction has been adopted consisting of iron steel columns and beams, with heavy plank floors; the columns, beams, and under side of the floors being protected with "mackle" plaster boards on which the finishing plaster is laid. The partitions are also constructed of solid mackle 6 in. in thickness, material that, while very light in weight, is unexcelled in its fire-resisting properties. The roof is of the same general construction as the upper floors of the building, and is covered with tin.

As we have already said, the platforms are covered by a single span roof, 259 ft. 8 in. span centre to centre of bearings (see section). The trusses forming this roof are of wrought-iron, and are hinged at the crown and springing line, and vary in depth from 2 ft. 6 in. at the haunches to 6 ft. at the crown and 4 ft. at the springing. Pins 5 in. diameter are used at the summit of the roof, while those at the bearings of the trusses are 5 1/2 in. in diameter. The form of the roof and its proportions have been designed with great care, so as to produce the best artistic and architectural effects, and at the same time conform to the requirements of economical construction.

To the architectural engineer a roof is always an interesting study, and when roofs of large spans have to be considered, the interest naturally increases. The problem, of course, to cover a certain area with a substantial roof, but in addition to this the architectural question of an artistic design in harmony with the other parts of the building is of very great importance. The trusses in this case are placed 30 ft. apart, centre to centre, and the assumed loading for determining the stresses and necessary sections were taken as follows:—

	Lbs. per square foot.
Weight of trusses, purlins, rafters, &c.	25
" covering	8
" snow	12
	45

Wind pressure was assumed at 35 lbs. per square foot against a vertical surface, and consequently against the curved surface presented by the roofs it was taken as varying between 15 lbs. and 30 lbs. per square foot.

The floor carrying the platforms, &c., is constructed of buckled plates carried by plate girders. Concrete is first placed upon these plates and on this there is a layer of eucalypt asphalt one inch in thickness. Under the platforms the space has been utilized by the construction of an important market, and below this cellars have been built for cold storage.

As a general rule it is rather a delicate matter with the engineer or architect to give the cost of the work under his charge, as it often involves questions in confidence between himself and his client. The subject, however, is one of special interest to the professional man, as it enables him to put a check on his own estimates for similar work. In the present case, the cost of the station building, exclusive of heating, electric lighting, elevators, and other appurtenances, for these special items, was practically 97 pence per square foot of superficial area, or 11 1/2 pence per cubic foot of content, computed between outside faces of exterior walls, and from floor to ceiling to top surface of roof. The station proper, that is, the platforms, &c., which are covered by the large roof, the lobby, inclining foundations and the cold storage cellars and rooms, cost 17 1/2 pence per square foot of surface covered. The structural work of the large roof cost 4s. 9d. per square foot of surface covered.

A full description of the work in detail is given in Mr. J. W. Wilson's able paper published in the August number of the Transactions of the American Society of Civil Engineers of this year, which contains such interesting information which is likely to be serviceable to those connected with the design or construction of railway-stations.

NOTES.

THE New York correspondent of the *Times* gives the result of the Report of the Nicaragua Canal Commission, which seems to indicate that so far the promoters of the canal have been falling into the same fatal error as in the case of the Panama Canal; formulating a great engineering scheme on an insufficient survey. The Commission reports that it would be most inadvisable to attempt the construction of the canal on the data now available; that new surveys are needed; and that they estimate the cost provisionally as about 133 1/2 million dollars, or nearly double the Canal Company's provisional estimate. We feel convinced that the Atlantic and Pacific will ultimately be connected by a canal through the isthmus between North and South America, but the world will not stand another Panama Canal business, and the Commission has done good service for the present in showing the necessity of caution, and of thorough surveys, before proceeding any further in the matter.

THE proposal to destroy the Trinity Hospital at Mile End, referred to in our last issue, has attracted a degree of public attention and opposition which leads one to hope that the London public are becoming a little more alive to the picturesque and historic value of their ancient buildings. A great many of the daily papers seem to have taken part against the scheme; the *Daily Chronicle* even collected and sent the amount said to be requisite for putting the buildings in a sanitary condition. Perhaps it is not very surprising that this was refused; it was a somewhat obtrusive interference, although one can entirely sympathise with the intention. The "Committee for the Survey and Registration of Old and Interesting Buildings of Greater London" have addressed petitions, in nearly the same terms, to the Charity Commission, the Trinity House, and the London County Council, pointing out that the Trinity Hospital, or College, owing to its intimate connexion with the naval and mercantile history of England, may be considered to rank as a national memorial, full of historic association; that the present group of buildings provides for London a fine open space in one of its greatest and most crowded thoroughfares; that any building over of the site, which would result from the sale of the property, would be greatly detrimental to the health and well-being of the neighbourhood; that the actual buildings have great æsthetic value, being unique of their kind; that they are in the nature of a local museum, being filled with many examples of statuary, inscriptions, memorial tablets, leadwork, and very valuable stained glass, removed by the Elder Brethren from their Hall at Deptford Strand in 1793; and that the plea of the unsanitary condition of the Hospital, which has been urged by the Corporation as an excuse for its destruction, is not true, or is at least much exaggerated (as is very probably the case). The petition is signed by Mr. C. R. Ashbee, Chairman of the Committee, and by Sir Walter Besant. The Committee on behalf of whom they act includes among its honorary members Sir F. Leighton (Honorary President), Mr. William Morris, Mr. Hamo Thornycroft, Mr. G. Frampton, Mr. J. T. Micklethwaite, Mr. J. J. Stevenson, Mr. E. W. Mountford (Hon. Vice-President) &c. &c. It is to be hoped that this petition, and what has been said in the papers, will have some effect, but it is extraordinary what persistence people generally show in destroying an interesting building when they have once got the notion into their heads.

THE Commissioners of Her Majesty's Works and Public Buildings have notified their intention to apply for an Act which shall authorise them to acquire, by compulsory purchase or otherwise, certain

property for the purpose of erecting public offices on the Parliament-street (Westminster) site. The lands and buildings in question are situated within the area bounded on the north by Charles-street, on the east by Parliament-street, on the south by Great George-street, up to and including No. 23 in that street, and by Boar's Head-yard, and on the west by Delahay-street and the new buildings of the Institution of Civil Engineers.

THE recently-reported case of Lord Battersea v. the Commissioners of Sewers raised an ingenious point in regard to the law of light. The plaintiff had had an access of light for more than nineteen and less than twenty years: the full prescriptive period of twenty years had thus not run, but, on the other hand, as to defeat a right there must be an interruption of a year, it was argued on behalf of the plaintiff that he was entitled to an injunction because there never could be any such interruption as would defeat his right. The judge held, however, that he must act on the words of the statute, and that he could not grant an injunction till the full statutory period had elapsed. The decision was a sound one: the judge was really being asked to go beyond his jurisdiction. It was as nearly as certain as anything could be that the plaintiff was merely anticipating a right which would be in existence in two or three months. But it would have been dangerous to act on this rough and ready principle, and introduce a new and rather risky ground of judgment.

WHILE we recognise Dr. Longstaff's paper at the Architectural Association (reported in full on another page) as in the main a most able and fair summary of the subject of the Municipal Control of Buildings, we cannot by any means agree with him in thinking that the framers of the London Building Act did wisely in allowing any class of dwelling-house with walls only 9 in. thick. In this climate a single-brick wall is not thick enough for an outside wall, even if we could insure it being always well-built, which we cannot do. It is all very well to say it is a question of cost; that argument might be applied to a great many more requirements of the Building Act. It is always more costly to erect substantial and sanitary houses than unsubstantial and insanitary ones; that is exactly why a Building Act is required.

THE circular of the Board of Trade in regard to precautions against the bursting of domestic boilers during severe frost is well-timed. It is, we should suppose, primarily addressed to insurance companies, as we do not imagine it is to be delivered to every householder in the kingdom. It is, however, doubtful if any number of circulars will prevent these explosions, since those who now take insufficient precautions will, probably, not be more careful because the Board of Trade issues a circular on the subject. Self-interest is the only cause of care in such cases, and insurance companies are frequently the persons most interested.

THE electrical tramway which has just been completed at Coventry, however useful it may prove, can hardly be regarded as beautiful. It runs from the railway station to Bedworth, a distance of six miles, passing through the villages of Foleshill, Longford, and Exhall. The overhead work is a very good object-lesson to town counsellors and others, as almost every variety of method is employed. For the first part of the route the trolley wire is supported by span wires, stretched between plain tubular posts situated on each side of the street, a primitive method long since discarded by every self-respecting town in America. Next it passes Grey Friars Green, and along here the wire is suspended from single bracket standards which form

part of the railings, the effect being not unpleasing. However, span wires are soon resorted to again, the wires in many cases being fixed to rosettes bolted to houses on opposite sides of the street, special precautions being necessary to prevent the vibration of the trolley wire being communicated to the houses. There seems to have been very little attempt at either uniformity or elegance, the methods of suspending the wire proving the ingenuity of engineers to whom economy and efficiency were the only considerations. The rails used are the rails of the old steam tramway which came to an untimely end nearly two years ago. Consecutive rails are joined together by the now well-known "Chicago" bond. There are eight cars fitted with motors, and two without motors, which will be used as "trailers." The cars are well made, and each has ten 16 c.-p. lamps lighted direct from the trolley, a great improvement on the light one gets in a London omnibus. At Foleshill, about the middle of the track there is the power station, which is thoroughly equipped with the best modern engines and dynamos. The principal lesson to be learned from this tramway is that the "overhead work" is the most important from the citizen's point of view, and that this part of the work should be supervised by some one who has some respect for the most elementary principles of art.

THE Council of the Institution of Electrical Engineers have nominated Sir David Salomons as President, an action which is being strongly opposed by many members, and to a certain extent by the electrical press, on the ground that the post should only be held by one who has attained the highest eminence in electrical science or engineering. The burden of the objection no doubt lies in the fact that Sir David Salomons is an "amateur;" that is to say, he does not pursue electrical work with the object of making a living; but those who know what "M.I.E.E." really amounts to will probably think that, until the Institution is more strict in the election of its members, it is absurd to pretend that by electing an able and educated man like Sir David Salomons, whose book on "Secondary Batteries" was for a long time the standard work on the subject, the members are doing otherwise than honouring themselves.

MANY of our readers will hear with regret of the death of Mr. Philip H. Rathbone, of Liverpool, who was as well-known in artistic circles in London as in his native city. Mr. Rathbone was a member of a family who have for several generations held an important place among the great shipping houses of the port on the Mersey, and "Green Bank," the house which has been occupied by one head of the family after another, has been known to many distinguished visitors from all parts of the world. Mr. Philip Rathbone was, we believe, the first of his family who directed his attention specially to art; and he exercised a great deal of influence in creating a new interest in art in Liverpool. It is probably almost entirely due to his personal persistence and to his liberality that the sculptured panels at St. George's Hall, neglected for so many years, were ever commenced; or that, being commenced, they were ever continued, the first panel having aroused a violent opposition from people who had probably never given a thought to ideal and decorative sculpture in their lives, and who could not understand the sculptor's intention. Mr. Rathbone may not always have been quite judicious in his artistic polemics—he was not particularly careful to conceal his contempt for those who did not share his enthusiasm about art; but his enthusiasm was genuine and his judgment generally sound, as would probably be testified by many eminent artists who will miss in him an appreciative friend.

THE small paintings in Mexico, by Mr. Mortimer Menpes, now on view at Messrs. Dowdeswell's Gallery, appear to be a series of very clever theatrical tricks in colour effect, worked up for the purpose of an exhibition, rather than a genuine study or portrayal of the life and character of the country supposed to be represented. Mr. Menpes has no doubt remarkable powers as a colourist, and he has evolved a technique and texture of his own which assists in giving individuality of character to his works; but his art is insincere and pretentious, and (to judge from the list of prices appended) the public has been mystified into thinking these stagey effects of much more value than they really are. In the other room at Messrs. Dowdeswell's are a number of Mr. Wimper's drawings, mostly the same which were lately exhibited at the Fine Art Society's Gallery, and it is rather melancholy to find some of the most beautiful small landscapes one could wish to see, offered at prices that are so ridiculously low in comparison with the sums asked for Mr. Menpes's small groups of badly-drawn figures in artificial light effects, remarkable in point of colour, no doubt, but in a certain sense representing neither nature nor art. Some of the slight sketches in light-coloured frames at one end of the room, and which seem to represent the unsophisticated studies on the spot, before the cooked-up effects were developed, are far better in an artistic sense than the finished works, "Mid-day, Jalapa" (37) especially, which is a charming and complete little sketch, and far more genuine work than its more luridly-coloured neighbours.

THE small exhibition of original lithographs at Messrs. Dunthorne's turned out to be very interesting. The works exhibited were mostly by artists of known powers, some of whom had not previously made use of this medium of work. Mr. W. L. Wyllie, in "Brighton Beach," succeeds in producing a remarkable light and airy effect by very slight means. Mr. Watts and Sir F. Leighton contributed studies of heads in red, and Mr. Legros a very powerful portrait of Cardinal Manning. Mr. Axel Haig sent two or three architectural subjects; we do not know that they indicated the effect of lithograph as equal to that of etching. The best powers of lithograph are shown in broad massing of light and shade, as in Mr. Overend's powerful study of the stern of an old line-of-battle ship, under the title "Cheering the Admiral," and in Mr. Goff's "The Deserted Quarry." Mr. Short, as in "Timber Ships, Yarmouth," treats lithograph almost exactly as he does etching—putting a few delicately-outlined subjects on one portion of the paper, and leaving a wide expanse of untouched surface between that and the slight indications of foreground. This is an admirable kind of scheme for bringing out the most characteristic qualities of etching, but as a treatment for lithograph it seems to be throwing away a good deal; and although the line-work in such a drawing is different from etched line-work, it could be done just as well with a pencil-point, and on ordinary paper, as with lithograph chalk on transfer paper, and on the whole would look better. Mr. Herbert Dicksee's drawing of a tiger, walking with long strides, is an admirable animal study; the creature seems really to move.

THE Art for Schools Association is now holding its annual exhibition at 29, Queen's-square. It will be open till December 9. The pictures are principally well-known ancient and modern works reproduced by various processes, and all of them at most moderate prices. The Association is certainly doing a good work in bringing beautiful pictures within the reach of everyone, more especially of school-children, though we must confess that neither Rossetti's "Veronica Veronese," nor "Death as a Murderer," by Alfred Rethel,

seems at all suitable for school-room decoration. There is a fine heliogravure of Constable's "Salisbury Cathedral," a very beautiful photograph of Turner's "Téméraire," and a photograph, in two sizes, of Hobbema's well-known "Avenue." There are some very good photographs of wild animals evidently taken in the Gardens, which we do not remember to have seen in previous exhibitions. There is a good set of decorative friezes by M. Paul-Albert Baudouin, the high glaze on these, however, though may be desirable from a sanitary point of view, rather spoils the artistic effect. We noticed also a chromolithograph of Magdalen College, which was so successful in the blending of colour that it might almost have been taken for a water-colour drawing. The Association deserves the sympathy and support of those who desire that children at our schools should be familiarised with good designs and representations of nature in cheap form.

A "FINE-ART COMPETITION" announced to be held early next year at the galleries of the Royal Institute of Painters in Water-colours, instituted apparently by Messrs. C. W. Faulkner & Co., who intend to give prizes to a large amount, and hold out hopes of their purchasing also a good many of the works which prizes are not awarded. The works are to be classed under three heads: Pictures suitable for reproduction as presentation plates, frontispieces, or as studies for painting; designs for show-calendars, almanacks, &c.; and designs for Christmas cards and other cards of similar type. These two latter classes may perhaps show something that is interesting and new in this class of design. The judges are three Royal Academicians, Messrs. Calder, Luke Fildes, and A. C. Gow. There is to be a fourth section devoted to photography. In connexion with the same subject we may also note that Messrs. Carl Hentsch & Co. are offering three prizes for the drawing to be used as an advertisement, the judges being Mr. Lewis F. Day, Mr. Jacob and Mr. Joseph Pennell.

A NEWCASTLE paper, the *Daily Leader*, has been entering on the field of architectural criticism in regard to the new buildings in that city; or perhaps we should not say criticism so much as congratulation. Everything seems to be for the best in the modern architectural improvements of Newcastle, more especially in the case of the new Freemasons' Hall, "which is built in the Ionic and Doric styles, which conjointly produce a good effect, with the lighter style of the latter supported by the more substantial Ionic." (!) It is a pity that daily papers when they attempt architectural criticism, do not put the matter into the hands of a person with at least sufficient knowledge of architecture to avoid such nonsense as this.

THE recurrence of lectures on the architecture of Robert Adam, in the lecture-lists of provincial architectural societies, would seem to indicate a curious tendency to revive the old Adam, were not for the fact that the papers are all by the same author, who gave a lecture on Robert Adam some little time ago at the Society of Arts (in which his architectural merits were rather exaggerated), and who seems now to be reading the same paper to various provincial architectural societies. This is a new departure in the system of paper-reading, and not, we think, a commendable one. A society which invites any one to read a paper expects generally a paper written for its Proceedings, and cannot be very much complimented at being given a stock paper which has been previously read on several other occasions. At all events we must give notice to the hon. secretaries of provincial societies that we can give further reports of this peripatetic paper to Adam.

THE PROPOSED HONORARY CORRESPONDING MEMBERS OF THE INSTITUTE.

It is important not only that the roll of Honorary Corresponding Members of the Institute in foreign countries should be kept filled, but that it should be well filled, and further with names of men who hold a high position in their respective countries, otherwise the distinction will lose some of its value. Lately this seems to have been more fully recognised than perhaps it was at one time, and the selection has been made for fuller enquiry.

Three names proposed will be put up for the ratification of the general meeting on Monday next, and it may therefore be of interest to give some little account of the foreign architects whom it is proposed to adopt as Honorary Corresponding Members.

The absence of any name of a Russian architect in the list, which was referred to by Mr. Penrose at his address last session, is now to be amended, though the field is a wide one to choose from. The Council have done well in selecting Professor Victor Schroeter, who not only holds a leading position among his professional brethren in Russia, but is also a prominent official, and an architect widely known beyond the limits of his own country. Professor Schroeter, who is now Privy Councillor, holds the position of architect of the Czar's Theatre at St. Petersburg, and is the "Architecte-en-Chef de l'Administration Générale des Appartements." He is principally known in connexion with his position on the Imperial Theatre Administration, as the architect of numerous theatres and opera-houses in Russian provincial towns. His practice extends to Siberia, where he has erected theatres at Irkutsk, Rybinsk, Nijni-Novgorod, and Tiflis, among other cities, have theatres from his designs. Of these the building at Tiflis is certainly the most remarkable for its excellent and at the same time novel plan and its successful architectural treatment. Professor Schroeter's design for the Grand Opera House at St. Petersburg, the plans of which had been passed by Alexander III., just before he died, perhaps best shows the proposed new Corresponding Member's ability. We were able to reproduce some of the drawings in December, 1894; and from these it will be seen how successfully, and with what originality, this scheme was worked out. Among the essentially utilitarian works which Professor has had charge of in connexion with his position in the Czar's Administration we may, as the first place, note the alteration and extension of the Mary Theatre at St. Petersburg in 1885. This building has seating accommodation for 1000, and covers a very large area. The Alexander Theatre, of the same administration, is altered in 1890, and the central administrative block extended in the same year. Professor Schroeter also superintended the erection of some of the scenery stores for 135,000 costumes, 20,000 pieces of armour, and innumerable sets of scenery, which are used by the six theatres of the administration. All these works are unusually successful on account of their excellent planning. Professor Schroeter, as his name implies, is of German nationality originally.

It is curious to observe how often it just falls to the lot of men who have made a name as theatre-builders to be Honorary Correspondents of the Institute. Last session Herr Fellner, of Messrs. Fellner & Helmer, was elected. The firm has erected some forty of the finest theatres on the Continent. M. Garnier (Paris Opera-house) on the roll; the late Baron Hasenauer (Vienna Court Theatre); Von Ybl (Buda Pesth Opera-house); Signor Basile (Palermo Theatre), have held this distinction. The study of their successive designs is highly interesting.

Herr Stuebben, the second of the three new members proposed, is practically the leading city engineer of Germany, and is recognised as the most prominent official architect in the country. At his office should be in Cologne instead of Berlin is somewhat an anomaly, but his professional work, as in the case of other prominent surveyors in Germany, such as Mr. Lindley (Frankfurt), and Herr Meier (Hamburg), practically extends over the German-speaking countries of the Continent, if not further. City Councils abroad do not adopt the same shortsighted policy some of our English municipalities, in restricting private practice of their leading officials. They consider it beneficial for their officers to be in contact with other matters than those of their own limited city sphere, and the authorities congratulate themselves if their officers are prominent men, whose advice is sought by outsiders.

Herr Stuebben's name has been principally associated with the laying out and "improvements" of the larger German towns, and his excellent work at Cologne has done much to increase the prosperity of this city and improve its bill of health. He has also been associated with the Cologne Cathedral improvements, which included the rearrangement of an extensive area, and he has taken a very prominent part in the German movement for better housing of the working classes. Herr Stuebben frequently contributes to the journals of his country, and has lately published a book on the laying out of cities. It would take too much space to mention even the more important instances in which he has acted as expert or arbitrator, and among the distinctions which have been conferred on him we would note an *ex-officio* seat in the Cologne Common Council, a distinction which can only be conferred with the sanction of the Prussian Government, and is rarely accorded.

Herr Carl Heilmann, who recently visited London, has probably been proposed on personal grounds. He is Deputy City Architect of Cologne, and is on the retired list of "Crown Inspectors." The restoration of the Gürzenich Hall was his best work. We have nothing to say against his election, but we think it rather strange that he should take precedence in this respect of Herr Wallot, the architect of the Berlin Parliament Houses, and some other German names might be mentioned which have prior claims to the compliment.

Looking through the lists of foreign architects and surveyors who have attained prominent positions, we still find a considerable number of distinguished names which should figure on the Institute roll. The activity in building matters on the Continent, and especially in the public works of the German-speaking countries, has been unusual of late years, and has brought new names before us which should not be overlooked by the Council if they wish to keep in touch with the times. Many of the best examples of modern work abroad are illustrated in this journal, so that opportunities are afforded to our readers to study the progress made in different countries. We trust that they will also be an assistance in the selection of future Honorary Correspondents to the Institute.

THE ARCHITECTURAL ASSOCIATION:

THE MUNICIPAL CONTROL OF BUILDINGS.

The third ordinary meeting of the session of this Association was held on the 22nd inst., in the meeting-room of the Royal Institute of British Architects, Mr. W. D. Caröe, M.A., F.S.A., President, in the chair.

New Members of the Association.

The President submitted the names of the following gentlemen for election as members:—Messrs. P. G. Silley, A. E. Willey, F. J. Lloyd, E. H. Morphew, W. W. Biss, F. C. Evans, H. R. Groves, V. T. Hodgson, G. H. Jenkins, A. E. Nicks, G. S. Powell, J. H. Berner, K. Biong, F. Bond (described as "interested in architecture," and proposed by Mr. F. G. F. Hooper and seconded by Mr. E. R. Barrow), and Mr. J. Gamble (described as a "teacher of architectural drawing," and proposed by Mr. Alfred Waterhouse, R.A., and seconded by Mr. R. Phené Spiers).

Mr. H. Lovegrove asked whether gentlemen who were simply interested in architecture were now going to be admitted as members of the Association.

Mr. C. H. Brodie remarked that he also thought of raising the same question.

The President said the by-laws provided for the election of gentlemen who were interested in branches of the arts connected with architecture.

Mr. Brodie said he did not think a teacher of architectural drawing quite came under the description given in the by-laws. He presumed, however, that all the names had been passed by the Committee.

The President said it was quite within the province of the meeting to object to any single name. They were not bound by what the Committee had done in the matter—in fact the Committee would naturally wish to be guided in matters of this kind by the general meeting.

Mr. Brodie then proposed that the names of the two gentlemen who were not distinctly described as being architects be referred back to the Committee.

Mr. Lovegrove seconded the motion, and remarked that for many years they used to quibble about whether a man was articulated or not, and now they seemed to let anyone into the Association.

Mr. E. W. Mountford said it was no good referring the names back to the Committee. Everything had been done in strict accordance with the by-laws, and the names of the proposers or seconders ought to be a sufficient guarantee.

The President said the names had been fully discussed by the Committee, and he would be very sorry if the members thought that they were prepared to admit "anyone" to the Association. Mr. Bond was proposed by one of the members of the Committee, and Mr. Gamble was proposed by Mr. Alfred Waterhouse and seconded by Mr. Phené Spiers.

Mr. Lovegrove remarked that the Association would have to add to its title if it also became an association of teachers.

The President then put the names to the meeting *en bloc*, and they were declared duly elected.

Mr. B. F. Fletcher (Hon. Secretary) announced that the executors of the late Mr. Ewan Christian had presented some valuable books to the Association. He proposed a hearty vote of thanks to the executors for their kind gift.

The President stated that Mr. Christian provided in his will that certain books should be presented to the Association, so that really they were indebted to him and not to the executors for the books.

The vote of thanks was passed with acclamation.

The President announced that the first lecture on "Special History," by Mr. F. R. Farrow, would take place on December 16, at 6.30 p.m., and the first lecture on "Practical Design," by Mr. Beresford Pite, on January 6 next, at 7 p.m. Dr. G. B. Longstaff, L.C.C., then read the following paper on "The Municipal Control of Buildings."

The question naturally arises, Why should buildings be controlled by the Municipality? Do not those who build know their own business? Has not every man a right to do what he likes with his own? Is not the meddlesome interference of officialdom un-English, unpopular, and, in fact, an unmixed evil?

There is, of course, much truth in these suggestions. Speaking for myself, I am inclined to *laissez-faire* as a sound general principle, but, as is often the case when a conclusion does not seem to flow from admitted premises, there is a conflicting principle to be taken into consideration which may be shortly expressed in the words, "circumstances alter cases."

The experience of communities in which competition and individual caprice have been given free play shows that, where buildings are crowded together, evils are but too apt to arise and to assume such proportions as to become sooner or later unbearable, so that ultimately the Local Government has to step in and apply a remedy which under the circumstances may be difficult of application, unjust in its bearing upon individuals, and in any case is pretty sure to be costly.

To quote a few instances, and to begin with the most obvious. Cities and large towns must have some means of disposing of the excreta of their inhabitants, and of the large quantities of water fouled by the washing of their persons, clothes, and culinary utensils. This can be applied comparatively easily if the common works be carried out beforehand by or under the supervision of the Local Authority, and if the various buildings be erected so as to comply with certain general principles of construction and arrangement. On the other hand, to apply a drainage system after the town is built will be more difficult, more costly, and probably not so effective.

Yet even in such an obvious case as this the municipal control should be carefully regulated; it should be limited to general principles, and not enter into petty details of construction. The by-laws made by the London County Council under Section 39 of the Public Health (London) Act, 1891, scarcely appear to my mind to fulfil this condition, and I should not be surprised to find that many here concur. But if those gentlemen had seen the first or even the second draft of those by-laws they would be filled with gratitude towards those who criticised them, and in place of feeling aggrieved would rejoice at the comparative freedom they are allowed.

One reason amongst others which makes minute interference and precise regulations in such matters most undesirable is that it stops the way of experiment and so prevents possible improvements. The end to be aimed at may be definitely laid down, but not the means of obtaining it; on the contrary, the greatest possible latitude should be given to inventive energy. London legislation, wisely or unwisely, deals with drainage apart from other points of building construction, and I shall not allude to this part of the subject any further.

Assuming, then, that municipal control is desirable or necessary, and assuming also that such control should be limited in its scope, the first point to consider is in what respects it should be exercised.

Now buildings may be considered from the point of view of:—

- (1) *Stability*; (2) *Fire*; (3) *Health*; (4) *Position and mutual relations*; (5) *Convenience*; (6) *Beauty*.

As regards *Stability*, I presume that no one will object to the laying down of minimum thicknesses for walls, and of minimum scantlings of timbers, though it may be difficult to draw up a workable schedule for the latter. Also it will be agreed that sound principles of construction should be insisted on. Whether the provisions of the London Building Act err by excess or defect is for you to say rather than for me. It may be that some of its provisions dealing with construction, though they may not oppress builders, may serve no useful purpose, if so they are excrescences, and should be removed when opportunity offers. A good deal in this direction was done at an early stage of the Bill, but personally I regret that time did not allow of a more careful consideration of Part VI. before the Parliamentary Committees. However, architects well versed in the old law and the new will recognise that—outside Part V.—the new Act allows much more latitude. As instances in which this is the case I would quote Section 73, which permits, subject to certain limitations, the erection of bay-windows and projecting oriel windows without the formalities and delay attending a special application to the Council. Also the second paragraph preliminary to the First Schedule, which allows walls to overhang to the extent of six inches. Again, detached greenhouses, sheds below a certain size, and small cycle-houses can now be erected without special leave, or subject to less tiresome restrictions than before. Also Section 54 deals with openings and recesses in a much more liberal way than the old Act, a point that will be especially appreciated by City architects. Lastly, the words added to sub-Sections (11) and (12) of Section 201, in effect greatly extend the number of detached suburban houses which will be wholly exempted from the Act.

Fire affects buildings as regards their liability to burn when once set alight, the spread of fire from one building to another, and the escape from fire of their inmates. This part of the subject is one to which municipal authorities, as being also the fire-extinguishing authorities, naturally attach much importance. For this very reason it is a part of the subject which requires to be closely watched as being specially liable to a pedantic and officious treatment.

It is well known that the regulations of the London County Council as to the structure of theatres are so onerous that it is now a matter of great difficulty to erect a theatre in London, and there is a tendency to apply these regulations to small buildings of a comparatively unimportant character, which it is difficult to suppose that the Legislature intended to be so controlled. The 74th Section of the London Building Act (1894) deals with the protection of life from fire, but I fear that it will be found in many cases unduly onerous. It is at least open to question whether buildings only ten squares in area should be in all cases so constructed that the part used for trade should be separated from the part used as a dwelling-house by fire-resisting structures, but I believe that as a matter of fact this point was overlooked by the numerous opponents of the Bill. It is a matter of much regret to me personally that the projection of party-walls above the eaves is still insisted upon, even in the smallest dwelling-houses, as not only am I fully aware that the rule is strongly objected to by many architects on both structural and æsthetic grounds, but because the evidence tendered to the House of Commons Committee was in my opinion conclusive that this precaution is not required in the case of buildings used exclusively as dwelling-houses. On the other hand, that the new schedule of fire-resisting materials allows much greater elasticity than the old will I think be appreciated by those who have to work under it.

As regards *Health*—apart from all questions of drainage and water-supply—the points that arise are the thickness of walls, damp-courses and ventilation. The thickness of walls is mainly governed by questions of stability, but in the discussions that preceded the first drafting of the London Streets and Buildings Bill it was suggested that 9-in. walls should not be allowed in any case for dwelling-houses. There is no doubt that such

walls are objectionable; unless the best materials are used they cannot be trusted to keep out the rain, and they are cold. As a fundamental principle underlying all building legislation it should ever be borne in mind that while it is comparatively easy to enforce a standard of excellence which admits of measurement by the 2-ft. rule, it is practically impossible to prevent the use of inferior materials. Nevertheless it will probably be admitted that, taking into consideration the great importance of cost, the Council was wise not to advocate the extreme measure of abolishing the one-brick wall. Whether indeed it was wise in stiffening the schedule of thicknesses is, I know, disputed, and I was surprised that the first schedule was not gone into in Committee. The schedule as it stands was the work of practical members of the Building Act Committee, and it was left for practical men to criticise it. I believe the only suggestions in opposition came from one or two district surveyors who deemed the old rules sufficient.

The question of damp-courses is not an easy one. Foundations and damp-courses in London are at present regulated by the old By-law under Section 16 of the Metropolitan Management and Building Act, Amendment Act, 1878. A great part of this Act, including Section 16, has been repealed, but the By-laws continue in force under Section 216 of the Act of 1894. This By-law, although it admits of amendment, allows considerable latitude of practice. The main reason for its existence is, that while speculative builders do not, as a rule, see the necessity for damp-courses, layers of concrete and the like, after a wall has once been erected, a damp-course can only be inserted at the expense of much labour. Damp walls are no doubt unhealthy, without question they cause much trouble and annoyance to those who dwell within them. Mr. Stenning has pointed out that in so far as a layer of concrete beneath a building is designed to exclude emanations from the earth, it is more necessary in the case of a gravelly soil than in any other, yet the London By-law exempts gravelly sites! That this danger is a real one has been proved on more than one occasion by explosions of coal-gas in houses which have been traced to leaks in the mains under the impervious street pavements outside the houses.*

As regards ventilation, a sanitary requirement which in my opinion comes even before drainage in importance, it is obvious that we can do no more than provide the means for it, and these should be the simplest. It is both wise and reasonable to insist that every habitable room shall have a window or windows bearing at least a certain proportion to the size of the room, and that at least half of the area of such windows shall be made to open. Certain attempts in some provincial towns to prescribe the height of the top of the window above the floor have not only proved destructive of all architectural proportion, but have produced ridiculous results. Indeed, I have long been of opinion that, next to the general use of Welsh slates, few causes have in this country contributed so much to the deterioration of the architectural effect of ordinary commonplace domestic buildings as the almost universal desire for lofty rooms and large windows, more especially in the upper stories. The picturesque windows of the fifteenth and sixteenth centuries, nestling close under the broad eaves, and often placed nearer to the floor than to the ceiling, are a thing of the past. But even as compared with the last century, the ordinary street house of to-day looks top-heavy by reason of the size of the windows of the upper stories. All must admit that the modern bedroom is better lighted and ventilated, and more habitable generally, than those of the old half-timbered houses of Kent and Sussex; nevertheless, while admitting this, it is open to doubt whether Sir Christopher Wren and his contemporaries did not go far enough in this direction.

The question of the ventilation of buildings admits of an entirely different system of treatment. If any extreme advocate of economy still defend the system of "back-to-back" construction of houses I would recommend him to make an architectural tour of the Scotland ward of Liverpool—so-called I presume from the fact of its inhabitants being almost exclusively Irish. Our countrymen may as a rule be less unwilling to ventilate their homes, and may even revel in stuffiness, but the very poorest should have the means to hand for getting a current of air through their rooms on a hot summer's night, and the

sun's rays, which none of us get too much should have some facilities of access. Under the back-to-back system these primary requisites are lacking. This system reached perfection in Liverpool about half-a-century ago. An ideal plan having been invented, it was repeated wholesale as if by cunningly-devised machinery; the sultry evils proved ultimately intolerable, an enormous cost was imposed upon the Town Council in its efforts to remove them. It is surprising that Liverpool has led the way in preventive legislation.

The prevention of the erection of back-to-back dwellings is but one case of the general question of the *position and mutual arrangement* of buildings. Legislation in this matter is in my humble opinion of quite first-rate importance, its bearing on the public health; it is also beset with the greatest difficulties on account of interference with the rights of property. There is also a peculiar difficulty which needs to be emphasised, it is this: A lofty building does not interfere much, or perhaps at all, with its own light and air, but it may interfere with the light and air of its neighbours to almost any extent. No law yet enacted and no by-law yet in force has boldly faced this difficulty. A building proposed to be erected, whether it be itself dwelling-house or counting-house, stable or factory, may equal or smother a cottage now existing on the adjoining plot, or to be erected thereon in the future. For this elementary fact it follows logically, that regulations which it may be deemed expedient to enact prescribing the height of buildings and open space about them, should be applicable to all buildings, regardless of the uses to which they may be put. It is, however, doubtful whether Parliament would sanction such legislation. Hence we are driven to such compromises as legislation dealing with dwelling-houses or "domestic buildings." At first sight such compromise may seem to be a satisfactory conclusion, but to the inhabitants of a long row of cottages, with very limited back-yards, it appears less so. Picture to yourselves a row of six cottages having behind them small back-yards, which, in their turn, are separated by a wall from a strip of vacant land 40 ft. or so deep, and abutting upon a street parallel to, at the rear of, the six cottages. Two building owners purchase this vacant land—A, who purchased one-third of the frontage, and B, who purchased two cottages, and the law compels them to leave a certain space at rear of them, consequently adjoining the back-yards of two of the old cottages. The provision of this space may be a very serious matter to A, and may greatly detract from the value of his site he has purchased, but it has the wholesome effect of preventing any very material interference with the light and air of the old cottages, although the erection of the new buildings (or for matter of that of any buildings) may spoil the view from their back windows. B, warned by the experience of A, or having other views, invests his capital, erects on his plot the remaining two-thirds of the frontage, a warehouse or factory, and so doing is not compelled to leave any of his land vacant; on the contrary, he covers the whole of it with a building sixty feet in height, which may no doubt be a considerable rent, yet by his act he has made the back rooms of four of the cottages unfit for human habitation! Some one does not doubt say "how about ancient lights?" I reply is that the building-owner B may be compelled to pay a sum of money, possibly considerable sum, to the owner of the old cottages, but there is no law to compel the giving of a portion thereof to the tenants of the same, nor there the smallest reason to believe that they get any benefit out of the transaction, certainly they will get no compensatory light and air. There is however another course open to B, he may buy the old cottages and continue to let them as before, while the demand for houses will probably prevent any material fall in the rent. From this instance it is plain that the compromise of the present law fails alike to secure justice between individuals and the end primarily aimed at.

I am still of opinion that the angle of 45° enforced in Liverpool in the case of buildings on new sites is not an unreasonable one. I would urge on those who deem it excessive to take the first opportunity of inspecting some of the many houses erected in conformity with that angle in the newer parts of Liverpool.

To no one do the winding alleys of our cathedral towns or the picturesque irregularities of our old fortified cities afford more discomfort than to me, but there is a proportion in them

* Since this paper was written a notable instance, attended with loss of life, has occurred in the Strand.

even though we are too apt to forget it. We must, albeit sadly, resign ourselves to the hard fact that these things belong to an age that is past for ever. Would that it were otherwise! We know, however, that these old towns, so charming to our eye, were, to use a somewhat canting phrase, "hot-beds of disease." It is pretty surely ascertained that in the seventeenth century the death-rate of London exceeded the birth-rate, and that the population was only kept up by the constant stream of fresh arrivals from the country. If this were so when towns were of moderate size, and when only a minority of our people were dwellers in cities, how much more serious would be the results of picturesque overcrowding (that of Liverpool is not picturesque) be nowadays, when towns have attained such vast dimensions and yet continue to grow apace, so that an ever-increasing majority of the English people are doomed to spend their lives in the bustle and turmoil, the smoke and the smells, of the city of to-day.

Apart altogether from the sanitary aspect of the case, the greatly-increased traffic of the modern town demands far wider streets than formerly sufficed. Sir Thomas More doubtless thought he was acting very liberally when he laid out the streets of Utopia with streets twenty feet wide, but he went somewhat beyond the London Building Act in that he provided all the town-houses with gardens at the back in which were grown vines, fruits, herbs, and flowers. The houses were three "stories" in height; the materials were such as to resist the action of fire, and the line of frontage seems to have been very strictly observed, so that, as he tells us, "The buildings . . . are so uniform that a whole side of a street looks like one house." Three centuries and a half have thieved streets double the width thought ideal by More, but three centuries and a half have played sad havoc with his back-gardens! Art V. of the London Building Act, though esteemed by many, I fear, to be over-stringent and exacting, scarcely allows of open space at rear sufficient to admit of the successful cultivation of trees, fruits, herbs, and flowers, at any rate, not of such profusion as to suggest More's words: "All is so well ordered, and so finely kept, that I never saw gardens anywhere that were both so beautiful and so beautiful as theirs. This humour ordering their gardens so well, is not only kept up by the pleasure they find in it, but also by an emulation between the inhabitants of the several streets, who vie with each other; and there is indeed nothing belonging to the whole town, that is both more useful and more pleasant: so that the people who founded the town, seems to have taken care of nothing more than of their gardens."† It is often been remarked that whereas in the present day house-builders seek out exposed and sunny sites, the men of old time preferred sheltered valleys; it is all of a piece with this fact that we find the streets of Utopia described "as very convenient for all carriage, and well sheltered from the winds." If the gospel of fresh air and the gospel of expediency have done much to exclude the picturesque from modern towns, is this not an additional reason for exerting ourselves to the utmost to preserve what is left of the works of our forefathers?

As regards the internal convenience of buildings, it will be agreed that any control would be quite out of place. The quality of beauty is, of all others, perhaps at which modern buildings least often possess. Whatever may be the position of British architecture at the present day—and I am disposed to think that it compares very favourably with the contemporary architecture of other countries—the vastly greater portion of the buildings put up are built by men who, whether they call themselves builders, surveyors, or architects, deem architecture an expensive luxury, little enough, perhaps, for churches and town-halls, but a thing wholly divorced from the more numerous buildings in which folk have to live or earn their living. The general neglect of architecture—meaning, thereby, the fine art—merely by the builders but by the general public is a great misfortune to the country, and is not easily accounted for. It is a significant circumstance that the illustrated newspapers when setting the opening of a new public building as an event not omit to mention the name of the man who designed it, though the Worshipful the

Mayor, who declared it open, is honoured with a portrait. Probably few laymen follow the example of the reader of this paper in annually examining the architectural drawings at the Royal Academy; he has, in the room set apart for their exhibition, over and over again been amused at the astonished indignation with which visitors, perchance entering the doorway, have started back on catching sight of the drawings on the walls; he has even been unfortunate enough to disturb a loving couple seeking congenial retirement in its solitude. And yet the crowds that pay their shillings at the barriers would fain be called æsthetic, or at any rate persons of taste. Now, which is the more important work of art, a picture—grand, perhaps, in conception, and glowing in colour, yet doomed in the nature of things to spend the greater part of its lifetime upon the indifferently-lighted walls of a private dining-room, to be seen only by its owner or his comparatively limited circle of acquaintance, or a dignified building set in an important thoroughfare to stand there for centuries, a constant delight to the many thousands who will daily pass under its shadow? Or, looked at from the point of view of the amateur collector, which is the wiser course, to spend large sums upon pictures and statues, and to store them in ill-designed rooms which no ornaments can make lovely, or to devote a like amount of money to the building of a house so designed that every corner of it forms a picture ever changing in its charms with sun and shade? Nay, further, surely good pictures lose nothing by being hung in a beautiful house, where, indeed, they have a chance of forming a consistent part of the whole. Yet, again, architecture, above all arts, binds us to the past so that even a superficial knowledge of it, provided that it be accurate, not only adds vastly to the interest of history, but materially facilitates its study. On these several grounds it appears to me that the importance of architecture cannot be overestimated, and the argument is strengthened if it be kept in mind that we are from day to day becoming more and more a nation of dwellers in cities. In proportion as we are divorced from all contact with Nature, in proportion, alas! as modern "Progress" too rapidly destroys so much of natural beauty, so are we made more and more dependent upon such beauty as Art can give us in substitution for that which is lost.

Admitting, then, that beauty is a quality in buildings which is of supreme importance, and that outside comeliness pre-eminently concerns those who do not dwell within, is it a matter for municipal control? For my part, I think it is not. To begin with, the greatest latitude should be left to architects as regards design, whereas any system of municipal control would be apt to hamper the noblest efforts of genius, and at the best would tend to strengthen the tyranny of the prevailing fashion of the day. *Quis custodiet viz custodiet?* What one man deems beautiful another calls hideous, and I am by no means sure that this is less true of architects themselves than of vestrymen or county councillors. The Hanging Committee of the Royal Academy does not give complete satisfaction; could better results be expected from a Committee of Design?

Nevertheless, I have been an active advocate of a certain amount of control of an æsthetic character. I do not allude to the case of the County Council as a landowner approving the designs of buildings erected on its property by leaseholders, although in one such case I was partly instrumental in preventing the erection on a prominent site on the Thames Embankment of a building which would have marred irretrievably one of the finest prospects in London. That was a special case in which the Council acted as landlord rather than in its municipal capacity. But modern civilisation with perverse ingenuity has devised certain excrescences upon buildings which serve no useful purpose that I ever heard of, and which no Goth or Philistine will be hardy enough to claim as ornamental—to wit, sky-signs. This Association, at any rate, will not object to a municipal control tending to their ultimate extinction. A single advertising board judiciously placed upon the top of a building may vulgarise a whole street. To the end that one man may increase his income in a not very honourable way the purpose of vast outlay in public buildings may be thrown away. You will, I am confident, approve of the action of the Council in treating the huge advertising board on the top of a building and the sky-sign proper, as *ejusdem generis*—and this is now the law. Another enormity was first proposed for the offices of *Punch*, possibly as a far-fetched joke; the suggestion was to erect a cistern for a "sprinkler" upon lofty steel legs on

the top of the building, for all the world like a colossal spider. But the Council crushed this new form of vermin ere it had emerged from the egg. Whatever enterprising tradesmen may say to such municipal action, you, gentlemen, have no cause to complain.

From this you will gather that as regards design my view is that the Municipality should on the one hand take care that its regulations interfere as little as possible with the efforts of the artist, but that it should do its best to protect him from extraneous foes.

I have endeavoured very imperfectly to indicate the principles which should underlie the municipal control of buildings. It is perhaps rather in the application of those principles than in the principles themselves that differences of opinion arise. Meanwhile I may state in conclusion that before long it will probably be necessary to go to Parliament once more, not so much to strengthen the hands of the Council as to remove ambiguities or inconsistencies in the law which practice has brought to light. In some cases amendments introduced in committee by irresponsible opponents (and not always expressed in the clearest possible manner) lead to inconsistent or even absurd results, for it is an admitted defect of our legislative machinery that there is no means of re-drafting a Bill after its emergence from committee so as to ensure harmony in its several parts. In some cases provisions which have proved to be more far-reaching than was intended may need modification. But be this as it may I feel sure that any representations made by this Association to the Council would receive the most careful consideration and prove of great assistance in the drafting of any amending Bill.

Professor Kerr, in proposing a vote of thanks to Dr. Longstaff, said there was a feeling in the minds of many builders and owners to the effect that it was a great hardship to have to go to the County Council for any consent of a statutory kind, or, in point of fact, to have any dealings with Spring-gardens at all. He had always one answer for that suggestion and that was this: that there was not, and could not be, on the part of the County Council and its officers any desire to oppress or harass the public. Dr. Longstaff admitted that the provisions of the Act were found to be in many cases very vague, but the intention to his mind was always clear. As a public officer acting under the control of the County Council, when any dispute arose he always took upon himself to say "Let us understand what is the intention of the promoters of the Bill, and of the authorities who have sanctioned the Bill, in the clause which is in dispute." If they could find out what the intention of the law was, they invariably saw that it was a beneficent intention, and why should it not be fairly and cheerfully met? Speaking generally he thought Dr. Longstaff had given them a very clear idea of what he might call the tendency of public opinion upon the question of municipal control. In England people had a great objection to be dragged, and in respect of the Building Act it was just as well to acknowledge that, and to take pains to avoid in a proper way any operation of the Act which might be distinctly prejudicial to private interests. But although they objected to be dragged he did not think there was any private objection, as a rule, to public authority, and, therefore, when they had at last obtained in the form of the County Council a most important and valuable municipality, he thought that to place in their hands a good deal of control was a wise measure. It was always found in this country that the responsibility which attached to the practice of control or authority was a very important consideration, and, although some of the public judging from what was said in the newspapers, might have their objections to what had already been done by the London County Council, he thought that in the course of a few years it would be found that the sense of responsibility arising from carrying the load of authority would display itself in that case as in all others. As regarded London buildings, it seemed to be perfectly clear that very strict authority should be placed in the hands of someone, and the County Council had at their right-hand a large body of more or less distinguished architects and practical men in whose hands the details of administration were placed by the legislature, so that the County Council was well-advised, well-represented, and therefore entitled to the confidence of the public. That was as regarded construction, in respect of the points which Dr. Longstaff had very clearly made out. He thought the question of the administration of matters of taste in London metropolitan buildings

† Spelt "stories" in my edition dated 1728—G. B. L. The foregoing is Dr. Longstaff's note; to which we may add that "stories" is not only the ancient but the correct spelling, etymologically; the "storeys" adopted in the Building Act is a modern variation not sanctioned by the editions of the English language. There is no more reason for it than for writing "country" and "countries," "Utopia," &c. &c.

was one which deserved very serious consideration. Every architect who had been trained in the practice of architectural design would, he believed, agree with him when he said it was very hard that in London so much money should be laid out so frequently in building without any regard to public taste. The display of metropolitan building in all countries had always been a very powerful agent in humanising the people at large, and when they came to a town like London, as the centre and head-quarters of an enormous Empire, surely there ought to be in some quarter or other a very emphatic order of things as regarded the beauty of the town. He would venture to suggest whether it was not the common-sense of the matter that the expense of beautifying the metropolis of England ought to some extent to be borne by the public revenue. Why, he asked, should it fall wholly upon the accidental inhabitants of the town? Whether they should entrust the control of such a matter to a municipal body was a question which they probably should not discuss that night, but it was a matter which ought to be discussed. That was certainly a subject which could not be introduced into the Building Act of London. That Act must be a statement of the minimum requirements which were necessary in building private and public edifices, and directly they got beyond the minimum of necessity they found that the lawyers would not support them. There was a fixed principle in the English mind that every man should do as he pleased with his own, subject only to the absolute necessity of interference on the part of the public. As regarded the amendment of the Building Act which Dr. Longstaff shadowed forth, it would be well not to precipitate anything. They had got a very good Act, and although people might quibble at the language of it, yet, on the whole, he was of opinion that when they were able to understand it pretty clearly, it would work very well, with the assistance of moderation and human kindness on the part of the District Surveyors. But to administer such an Act with severity was a thing which he should deprecate with the utmost power at his command. It was not a system of rules which would bear to be interpreted in a harsh or arbitrary manner. It must always be remembered that the law was made for man, and not man for the law; and most emphatically was that the case when they came to such a matter as the Building Act.

Mr. R. Roberts, L.C.C., seconded the motion. He said that Dr. Longstaff had referred to the question why beautiful architecture should be confined to our churches and to our public buildings, and why our homes should not be delightful architecturally. He (Mr. Roberts) had always felt that that ought to be so. The buildings in which most of them lived had not been designed by architects, and, he thought he might add, had not been built by builders in the proper sense of the term, so that neither architects nor builders, properly speaking, were responsible for the present condition of London. He thought something should be done with regard to what he called the beauty of London. He was not sure that English people were either an artistic people or an architectural people, but he hoped the general public were beginning to take a greater interest in architectural matters. Dr. Longstaff referred to the Architectural Room at the Royal Academy. The little incident which he mentioned showed, he thought, that the general public did not, unfortunately, take an interest in architectural questions. Even our distinguished architects were not before the public eye as our distinguished painters. He should have been glad to have seen some architect of distinction come forward as a candidate for the London County Council. They lacked very often advice on architectural matters, which would come from one whom the architectural profession would recognise as an authority. The London County Council was constantly dealing with architectural questions. They had, for instance, large engineering schemes to consider. With regard to the design of bridges, they had indirectly consulted the Royal Institute of British Architects, and the consultation, he believed, had been very satisfactory. He was one of those who would wish never to see another iron bridge on the Thames. He would be glad to see stone bridges, but the engineering feeling was too strong for them; and, in fact, in these days of scientific development—he was going to say genius seemed to go in a scientific direction—the scientists were pressing them in all directions. The other day it was proposed to put a galvanised iron casing on the cornice of Waterloo Bridge 10 in. by 6 in. If they had had an architect on the Council, or someone representing architecture as a profession, he

thought they would have been greatly helped in such a matter as that. He had, perhaps, dwelt too much on this question of beauty with regard to local administration, but he felt it was a question which was continually pressing. There was a tendency nowadays simply to look upon the vested or private interest side of all matters. It was a question of what dividend would be paid, what return would be given, and how much would it cost the ratepayers. For instance, the County Council was now housed in a miserable building which was not a credit to the London Municipality, but they could not have a better, because the ratepayer cried out. When it was a question of sanitary reform the ratepayer was always willing to pay, but the Englishman was not yet sufficiently educated to pay for beauty. Professor Kerr had expressed the opinion that London improvements should, to some extent, be a matter of national expenditure rather than municipal. Well, there was a little departure in that direction. Parliament-street was to be made at the cost of the whole nation. But perhaps that was not a thing to proclaim upon the house-top, because the representatives of London were a very small proportion in Parliament, and it was quite possible that objection might be made to an expenditure of funds from the whole nation for the purpose of a single municipality. To return to the Building Act, he quite understood Professor Kerr's argument that there should be no immediate change in the Act before the District Surveyors had been able to master its provisions. Certainly he for one did not wish that they should have another voluminous Building Act to go through. But it was remarkable, as Dr. Longstaff had pointed out, how one or two of the clauses which had proved in practice not to be very workable—especially that clause with regard to the separation of dwelling-rooms above trade premises—had slipped in, and was not objected to by the Architectural Association, which was supposed to have gone so carefully into the Building Act, by the Royal Institute of British Architects, by the Surveyors' Institution and apparently by all the specialists. They unfortunately ran adrift on the question of vested interest, and the cry was "property, property." This particular clause, which he thought was too drastic, and which he was sure if it had been pointed out to Dr. Longstaff would have been amended, was, as far as he knew, not objected to by anyone. That showed how even specialists might fail to see some of the most important clauses of the Building Act, and so surely they would forgive the Committee who, generally speaking, were merely laymen, if they had not foreseen everything that might occur under the Building Act. He hoped the Act would, as he believed it was, be generously administered by District Surveyors. He thought there was a great deal in the personnel of District Surveyors in these matters. In these days of over-inspection perhaps it was important that the District Surveyors should administer the Act with a generous consideration, that was that they should think rather of the spirit than the mere letter.

Mr. Henry Lovegrove referred to Clause 74 of the Building Act, and said he wished they could have some decision on a well-versed case for the guidance of District Surveyors. Scarcely a day passed but someone called upon him with reference to Clause 74. In each individual case he tried to do what was in accordance with the law, and if those who called upon him did not care for that he told them that they must go before the magistrate. He was not about to give an opinion as to whether there should be parapets upon all buildings, but he thought it was the height of absurdity to ask a builder to build a parapet 15 in. above the roof to adjoining water-closets. About 9-in. walls to domestic buildings, if a building exceeded two stories in height, only one floor could be of 9-in. work. He thought that was an extremely good provision, because if they had two stories on a three or four story building of 9-in. work, there would certainly be an element of weakness. Dr. Longstaff remarked about the gravelly site, but he was afraid they did not come across gravelly sites in the inner parts of London. It was his fate very frequently to come across made ground. Everyone agreed that sky-signs were a source of danger to the public. Some people thought there was a great hardship in many cases in a board 2 ft. 11 in. being allowed to remain, while a board 3 ft. 6 in. had to be licensed. He thought there might be legislation on the subject before long. Mr. Roberts touched upon the question of having architects on the County Council. On the present County Council there was certainly one architect—Mr. Emden. Dr. Longstaff suggested that District Surveyors should, where possible,

try to settle questions themselves. He very rarely went to Spring Gardens, and if District Surveyors only tried to act in accordance with the spirit rather than with the letter of the Building Act they might give satisfaction to the persons building and do their duty to the public.

Mr. E. Woodthorpe said the Building Act had a great amount of good in it, but he could not quite agree with Professor Kerr that it was a piece of easy interpretation if they only considered long enough. Part VI. of the Act was supposed to deal with the construction of buildings, and one of the most important matters in the construction of buildings he took to be safety. In that respect District Surveyors had practically little or no control, except in the case of breasting and piers supporting bressummers adjoining party-walls. A pier at the corner of a building or a column they had little or no control over without reporting it as a dangerous structure. He thought that was a want in the Act which at some future time might be considered. Another point not dealt with in the Act was with regard to stones. There were a great many kinds of stones which were totally unfit to be used in this atmosphere. During the last three weeks he had had something like eleven pieces of stone brought to him by policemen which had fallen in different thoroughfares in the City. He had no power whatever over a stone unless he could go and condemn the whole building as dangerous. Another question which the County Council did not consider, although he drew attention to some time before the Act came into force, was the exemption of by-laws in the City. Sometimes they had jerry builders in the City, and they had no power whatever over materials, or to compel a man to put a damp-course or concrete over the bottom. Some buildings were very unhealthy in consequence. Of course it was very difficult to make a Building Act do for the whole of London. With regard to the insertion of Section 74, his recollection was that it came originally from the Institute in connexion with a Bill on which Mr. Institute, and Mr. E. T. Hall especially, spent a great deal of time. He (Mr. Woodthorpe) pointed out at the time the serious danger from fire in cases where the lower part of a building was occupied for trade purposes and on the upper floors there were hundreds of people sleeping. He would be sorry to see that clause struck out because he thought there would be a great amount of risk run in consequence. He remembered a case in the City where a fire broke out on the first floor, missed the second and burnt out the whole of the upper part of the building. There happened to be an opening in the party-wall, fitted with double iron doors, which by some authorities might not be considered in strict conformity with the Act, and about thirty girls, who were at lunch at the time the fire broke out, escaped through the opening, and there was no loss of life at all. An irregularity might therefore be a good thing sometimes. With regard to Section 53, as the law now stood, District Surveyor had no power to make a man do anything to an old party-wall if it was not taken down to the extent of one-half or altered. He ventured to think that with a slight alteration the clause could be made to convey what no doubt was the intention of the Act. Instead of saying "Subject to any by-laws of the Council made in pursuance of this Act, walls shall be constructed," it should read, "Buildings shall be enclosed with walls constructed, &c." He was raising that point he stated to counsel, "Supposing the whole of Cornhill were pulled down by building, and there was only a wooden partition between each of those buildings, do you mean to contend that I should not have power to have that taken down, and make them build a party-wall?" Counsel clearly stated that he should not have that power, and the magistrate also took that view. So that from this opinion (although counsel, and magistrates as well, were not always right) it would appear that unless a party-wall was dangerous, or taken down to the extent of half, or interfered with, or dangerous or any other clause of the Act were contravened, it would be difficult to compel a man to take down an irregular party-wall and rebuild it. Mr. Woodthorpe had very great pleasure in heartily supporting the vote of thanks to Dr. Longstaff for his great trouble in preparing the paper and his kindness in coming down to read the same.

Mr. J. Marsland said Mr. Woodthorpe occupied a very peculiar position as one of the District Surveyors of the City of London. Most of his remarks were applicable only to the City, and not to general buildings in London. The Building Act Committee were quite willing to ask Parliament for

much as they could get, but there was one thing they could not ask Parliament to do, and that was to interfere with the City of London. Therefore, they had been obliged to leave all these little anomalies referred to by Mr. Woodthorpe. The fact that the Act was contradictory here and there was due to the haphazard way in which the Legislature dealt with private Bills. How the Building Act emerged from the Committee-room in any sort of form he hardly understood, and until they got a better way of dealing with private legislation in the House of Commons he was afraid Bills would have mistakes which would have to be remedied afterwards. He did not think that Clause 74 was so hard in the case of a new building; in fact, he thought it was fair and reasonable. But further on the Act directed that buildings should not be joined together or added unless they were brought into conformity with the Act. That was a stringent provision and pressed hardly on owners of trade premises. Within three years of the passing of the Act a client of his had erected a substantial trade building, and he could not now add another piece to it because, to bring it into conformity with the Act, such an expense and amount of inconvenience would have to be incurred that was quite prohibitory.

Mr. Bernard Dicksee said he partly agreed with Mr. Marsland regarding the operation of Clause 74 in new buildings; but he would be extremely sorry to see it removed or rendered in the least degree less stringent. As Mr. Marsland pointed out, in some cases—for instance in alterations and additions to old buildings—it did press rather hardly; there was, however, a way out of that difficulty. Section 207 gave the Council power to relax that as they thought fit, and within the last week or two they had done so in the case of a building in his district. They ran much greater risk of danger to life by fire from the alterations and connexions of buildings than from the construction of new ones. Personally, he thought that a man might be allowed to connect buildings provided he put in iron doors, and left proper exits in each individual case. At the present moment District Surveyors were obliged to see that the buildings were entirely in conformity with the Act, and this might mean practically reconstructing the whole of the buildings. When Dr. Longstaff had something to do with the amendment of the Act, there was an anomaly existing at the present time to which he hoped he would give his attention, and that was the interference that the Vestries had in the construction of waterclosets, &c. He thought all the points of construction of buildings, whether from a sanitary point of view or from any other point of view, should be placed entirely under the control of the District Surveyor. Section 13, part II. of the Act, placed buildings intended for the occupation or adapted for the occupation of the working-classes under certain restrictions. He wished to ask what Dr. Longstaff considered a building adapted or connected for the occupation of the working-classes, because in a court about 10 ft. wide a building for the working-classes must not be higher than the width of the court, whereas if it was not a building for the working-classes it could go up possibly 80 ft.

Mr. Francis Hooper remarked that London was rapidly being reconstructed, and if they could not take advantage on every opportunity of some well-considered plan of alignment, each rebuilding would tend to the improvement and beautification of London. If they went into certain districts they were simply disheartened with what was being done by builders and speculators in the way of embellishing our streets. On the other hand, if they visited the Cadogan, the Grosvenor, the Norfolk, and other estates, they there saw fine lines of frontage being amended and substantial buildings being erected. Would it not be possible for a central municipal authority to assign private owners have of their property? He referred to the system in force in Paris, where every frontage line was in force in Paris, where an rebuilding must conform to the amended line laid down. It was found in many cases too slow, but it was sure, and having been in operation for one hundred and fifty years, they saw the result of ordered streets, which were conspicuously lacking in London, except in a few isolated instances. One of the gentlemen present referred to the advisability of electing architects on the County Council. Some architects had offered themselves for election, but the same gentleman had told the meeting that architects were not popular as a body, which counted for so few being elected. He ques-

tioned whether they would all be satisfied to leave their affairs architecturally in the hands of anyone who was elected for his politics. It had often occurred to him how desirable it would be if the various committees of the County Council had power to invite for conference representative architects, such as the members of the Art Standing Committee of the Royal Institute of British Architects, after the manner of the "Conseil d'Architecture" in Paris, and that, as Professor Kerr had suggested, matters architectural should be looked upon as of national, or at any rate of municipal, interest.

Mr. F. T. W. Goldsmith said he supposed the members present might take the remarks of Dr. Longstaff as indicative of the spirit in which the new building regulations had been conceived and should be carried out. He was sure Dr. Longstaff would forgive him for making the suggestion that the County Council might appoint some gentlemen in the profession as Aldermen. That would be an act distinctly consonant with the views expressed by Dr. Longstaff, Mr. Roberts, and others. The County Council could do a great deal in popularising architecture, and he thought Dr. Longstaff had expressed the views of those on the Council who were inclined to consider matters artistic.

The President said he was sure he was only stating what was already well known, that the many excellent removals of disabilities from the old Act were very largely due to Dr. Longstaff, and he thought Mr. Roberts also must have some credit for them. As architects, they were exceedingly glad to welcome the increased latitude which was given them by the new Act, and he hoped the County Council would themselves take a little interest in getting those disabilities removed from the by-laws which existed in the immediately surrounding districts of London. He was bound to take a little exception to what both Dr. Longstaff and Mr. Roberts said about the 74th Clause. They both stated it as a point of omission on the part of irresponsible opponents that that clause had been entirely passed by, but he thought that on a little consideration of the point they would find that that was not the case. The clause was considerably altered by the irresponsible opponents, and if it had been altered as suggested by them the hardships would have been removed. It was exceedingly pleasing to hear from Dr. Longstaff's erudite paper that Sir Thomas More was an advocate himself for simplicity in architecture. They could not quite believe that Sir Thomas More's straight line was exactly on the lines of Gower-street, but he was quite sure that if they could have seen Utopia as he imagined it it would have been a beautiful and simple piece of architecture which they could all admire. Although he thought it would be a great advantage to the County Council and to architects in general that architects should be represented on the Council, he could not bring himself to think that an architect who had to give up his time to such absorbing work would be prosperous in architecture, and therefore he thought that it was a matter that only architects who had been through the mill and perhaps made their pile could really take up. There was nothing so absorbing as an architect's occupation. If he wished to be successful he must give up himself to that solely, inasmuch as it involved such an enormous amount of knowledge of all the other subsidiary arts. Dr. Longstaff gave them some very well-chosen words in regard to the question of beauty in our great towns, and dealt with the question of the possibility of bound to say that he would very much like to see the appointment of some committee of taste, but he felt that as things stood at present that was virtually an impossibility. The only possible committee of taste, it seemed to him, was the public, and so long as the Press, which was the natural mouthpiece and representative of the public, remained utterly indifferent to architecture they might be quite sure that their buildings would not grow up in the way they should like to see them. Therefore it ought to be their object as architects to accept Lord Beaconsfield's advice, and to educate "our party"—our party being the public; otherwise never to put up anything which was not truly fit to be a work of art even of the most simple description.

The vote of thanks was then passed with acclamation.

Dr. Longstaff, in replying, said that as his paper was a holiday effusion a little inaccuracy might be excused. This miserable clause, No. 74, was a clause that never interested him personally, neither did many of the fire reservation clauses. He put them in rather as the spokes-

man of the Fire Brigade, but he was greatly relieved at the result of the discussion, because he found he was not in any way responsible for Clause 74. The President had reminded him that he at all events did not let Clause 74 pass unchallenged. Well, he could only say it was because their President did good by stealth. He did not oppose this openly in the committee-room, but he went into the lobby with Mr. Blashill and the County Council's Parliamentary agent, and amended it there. Professor Kerr found the chief fault with the Building Act not from its provisions but because it was full of bad language. Now it was some satisfaction to him to think in one respect that if he was disappointed at the Bill as originally presented not passing into law, at all events he was not responsible for the bad language introduced by opponents. Professor Kerr had said that the Building Act Department of the County Council had resolved to interpret the Act always with a generous spirit. He hoped that was so, but they must not take it as an official statement that that was the case. Personally he had always endeavoured to act upon this principle. It had always been his endeavour when difficult points were brought before them to separate the essential from the non-essential. If a deviation were required, by which nobody would be one penny the worse, he had always stretched the Act to the uttermost to allow the thing to be done. If it appeared to be a matter where real principle was involved, then he had put his foot down firmly. A law of this kind was very much a law of precedent, and if they established two or three cases against them they could never enforce the Act in cases which were of greater importance. He agreed that the architects were not responsible for the hideousness of London, but now Mr. Roberts informed them that the builders were not responsible. If neither was responsible, he supposed they must go to the handy-man, who was responsible for constructing a great deal of London. Replying to Mr. Lovegrove, he thought Clause 74 went very early into the Court, and a very rigid interpretation was put upon it. He was extremely thankful that sky-signs were dangerous; it was the only good quality they possessed. If they were not dangerous London would have ten times as many of them as there were now. They were an abomination which must be removed at all costs. Regarding Mr. Woodthorpe's remarks, the question of the pier was considered. Mr. Marsland, Mr. Roberts, and himself tried to frame clauses which would deal with that and other kindred matters; but it passed the wit of man to find any form of words which would meet the difficulty. They therefore put in those mystic words, "to the satisfaction of the District Surveyor." As regarded stone, he was afraid that was a question rather of quality. Although it might be possible to preserve stone by covering it with lead, still he was not quite sure that that would suit his aesthetic sentiments or those of Mr. Roberts. It was a great deal a question of the selection of the individual stones, and he thought that was a matter they must leave to chance. As regarded the foundation, Mr. Woodthorpe must go to the Commissioners of Sewers if he wanted to have a by-law made—they were the responsible authority in the City. He believed it was true that the County Council did put in the foundations of some buildings a short time before the Act of 1894 came into force. Whether it was done in *malice prepense* or not he was not prepared to say, but if it was, all he could say was that the Committee concerned, very shortly after the Act came into force, had the question of whether they should comply with the provisions of the Building Act of 1894 before them, and they passed a self-denying ordinance saying that, although, by the kind favour of Mr. Littler, the County Council had been exempted from the operations of Part VI. of the Building Act, they would nevertheless submit themselves to the control of their own District Surveyors, and act just the same as though they were not exempted. He did not know whether Professor Kerr would put his view of the wide and generous application of the Act in conjunction with Mr. Woodthorpe's suggestion that people in difficulties in regard to party-walls. That was a suggestion he would leave to Professor Kerr. Mr. Marsland spent many hours of hard labour over the new Building Act, and if he went into the congenial retirement of carrying on his own profession in the south end of London and got himself into difficulties over Section 74, that was only poetic justice. One gentleman had foreshadowed an awful future for Dr. Longstaff in having to reconstruct his own Building Act. That was a

horror greater than he cared to contemplate. As far as he was concerned he would let the Act severally alone for some time to come, and anything in the way of reconstruction he did not contemplate for one moment. He did not think he could ever get beyond deleting the difficult or troublesome clauses. The question had been raised by Mr. Dicksee about some readjustment of business between the Vestries and the County Council with respect to water-closet windows. In that small matter a great principle was involved. There would be a great discussion on the *delimitation* of powers soon, and he knew that many of the Vestries would claim to have the whole of the Building Act transferred to them. Whether the Association would prefer that or not he could not say, but personally, he was inclined to be in favour of a compromising clause. Some minor matters might be transferred, but he thought that some of the great principles, such as the lines of frontage and the laying-out of new streets, should always be preserved in the hands of the central authority. Mr. Dicksee asked what buildings adapted for being inhabited by the working-classes were. Did Mr. Dicksee know anything about the definition of an archdeacon? He thought that some study of that celebrated definition would perhaps enable him to come to some conclusion upon this point. If not he should recommend him to apply to the Council for legal assistance. Mr. Hooper had said something of the great virtues of large estates. There was no person who had a greater opinion than he had of the value of large estates to London, and he said this, not from any *a priori* ideas, but from the result of several years' experience of the administration of the Building Act. They had practically no difficulty in administering the Act in regard to large estates, but they had difficulty in *passing* it in regard to large estates. Mr. Hooper suggested, and it was afterwards alluded to by Mr. Goldsmith, that they should have co-optative architectural County Councillors. He thought there was a great deal to be said in favour of the suggestion that they should have one or more architectural aldermen; he would be very glad to get an architectural alderman. But he was not sure that that was a very easy matter. If the Association found some architect who had been such a success in his profession that he had retired while still in vigorous health and who was yearning for another occupation, on a private intimation of the fact he would suggest him at his next party caucus. He thought it was the desire of many members of the Building Act Committee that District Surveyors should try and look rather to the spirit and the intention than to the letter of the Act. He had never known of a District Surveyor being blamed for not carrying out the Act strictly, or because he had allowed people to make some slight technical divergence where no harm was done to anyone.

The President announced that the next meeting of the Association would be held on December 6, when a paper would be read by Professor Herkomer, R.A., on "Scenic Art."

Trinity Almshouses.

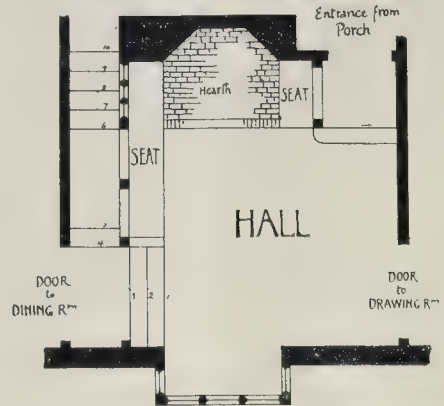
Before the meeting separated, the President moved the following resolution, which was passed unanimously:—

"That the Architectural Association, having learnt that the Corporation of Trinity House are about to make an application to the Charity Commissioners involving the demolition of the ancient buildings of the Trinity Hospital at Mile End, begs leave to represent to the Corporation of Trinity House and to the Charity Commissioners that these buildings are of great value to architects and architectural students as an architectural example of the period of Sir Christopher Wren, and that consequently their destruction would be a national loss. The Architectural Association therefore would request that any proposals in connexion with the Hospital may ensure the preservation of the buildings."

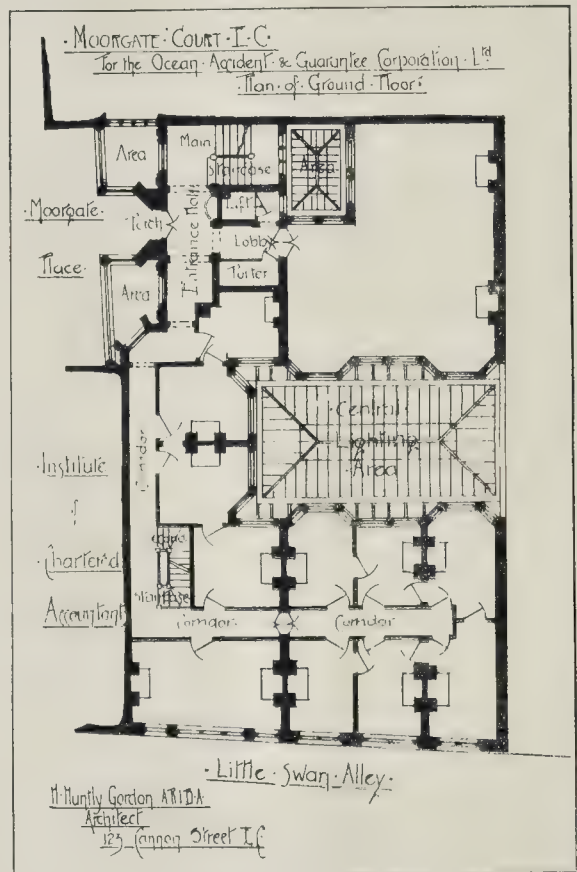
Illustrations.

CENTRAL HALL AND PUMP-ROOM, HARROGATE.

THIS drawing illustrates the Pump-room and General Assembly Hall of the new baths at Harrogate. The several suites for ladies and gentlemen, the Turkish bath, winter garden, cooking and refreshment rooms, &c., are all entered from this central apartment, which it is proposed to richly decorate with colour. Plans and other drawings of the building have already appeared in the *Builder* of August 2, 1890, and a general view of the building under



Hall in a Country House.—Plan.



date May 9, 1891. The architects are Messrs. Baggallay & Bristowe.

The drawing from which the illustration is taken was exhibited at the Royal Academy this year.

COUNTRY HOUSE AT BEDFORD: THE HALL.

THIS hall forms the central feature of a small suburban house with two other sitting-rooms and five bedrooms.

In the general treatment a broad, homely character has been aimed at, and an effect of simplicity and comfort has been held to be preferable to chill magnificence.

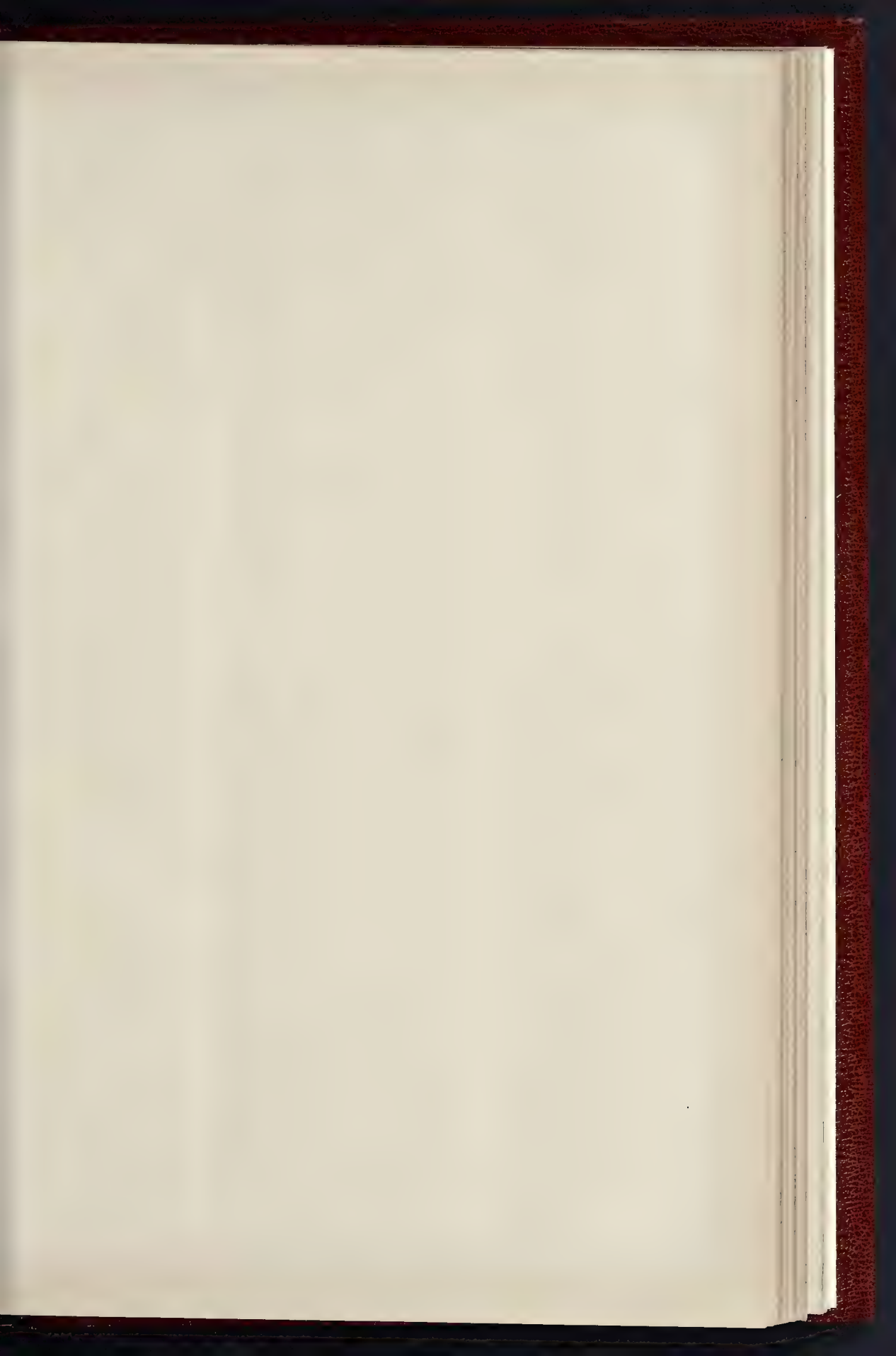
The hall is carried up through two stories with gallery as shown, and opposite it is a large mullioned window, which extends from floor to ceiling and faces the south.

This drawing was exhibited in the Royal Academy this year. The architects are Messrs. Baillie Scott & Seton Morris, of London.

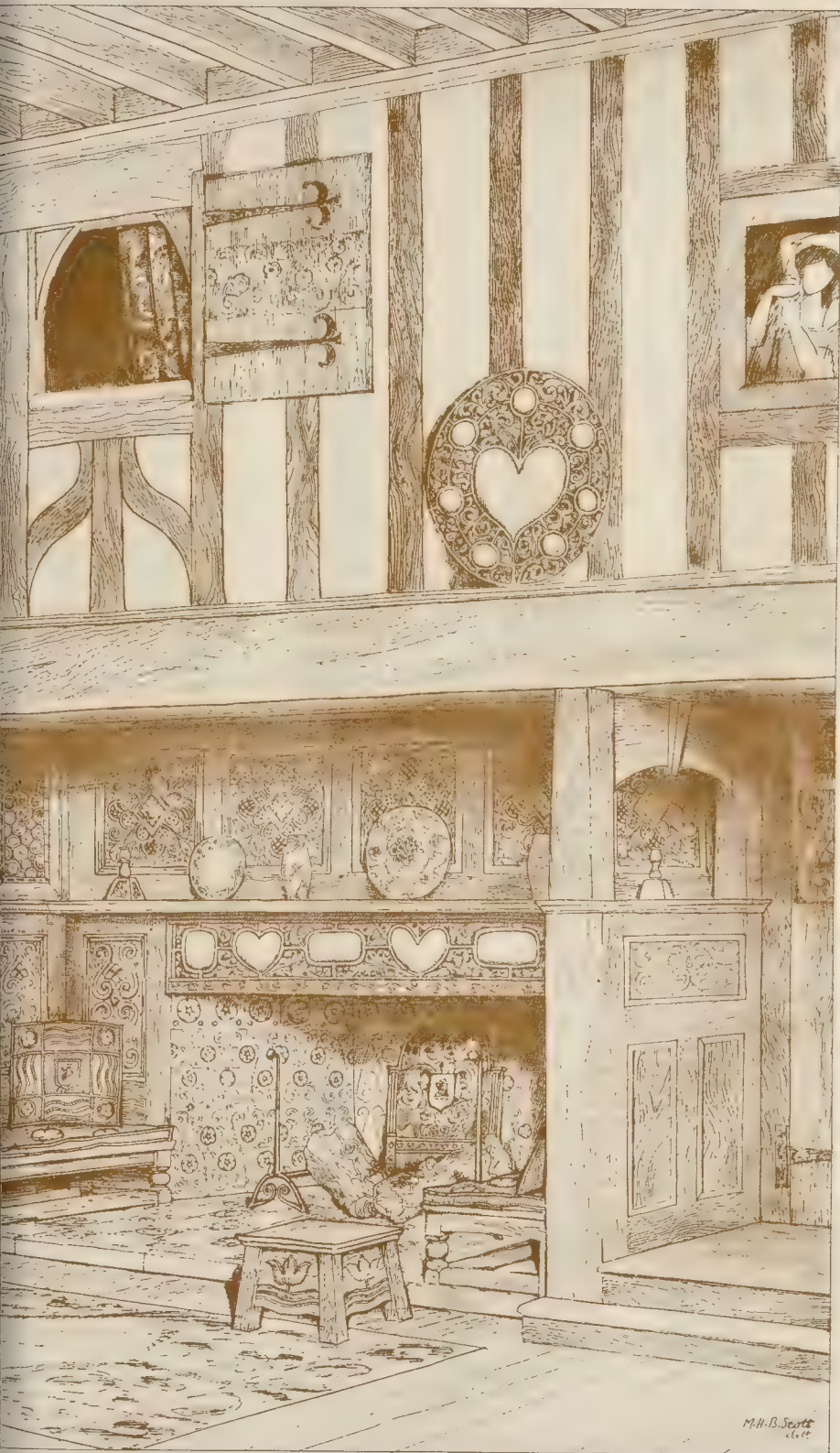
MOORGATE-COURT AND 123, CANNON STREET.

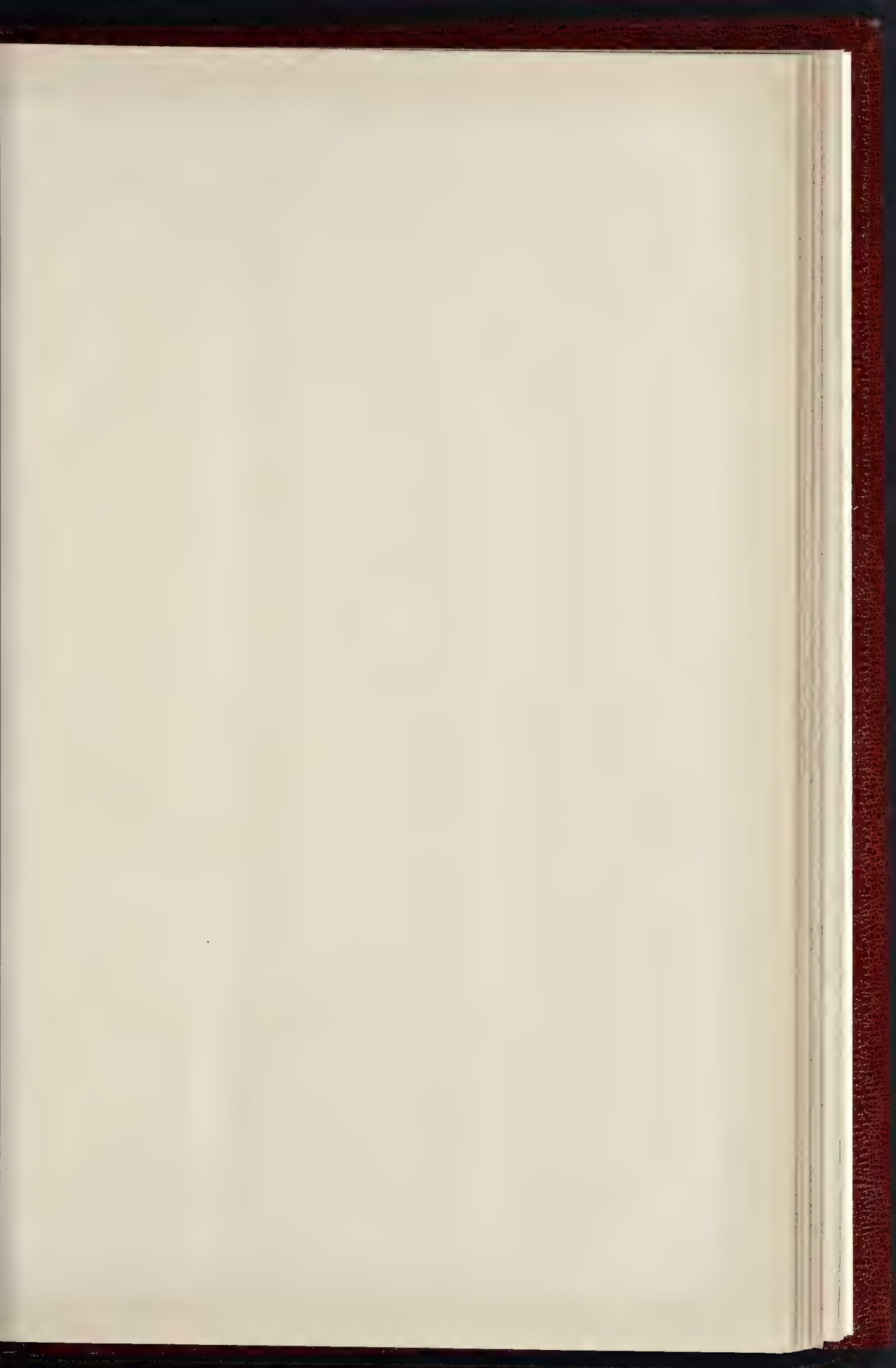
THE drawing which we reproduce to-day was exhibited at the Royal Academy of 1894.

The larger building represented is the new entrance-front of "Moorgate-court," town Moorgate-place, and adjoins the Institute





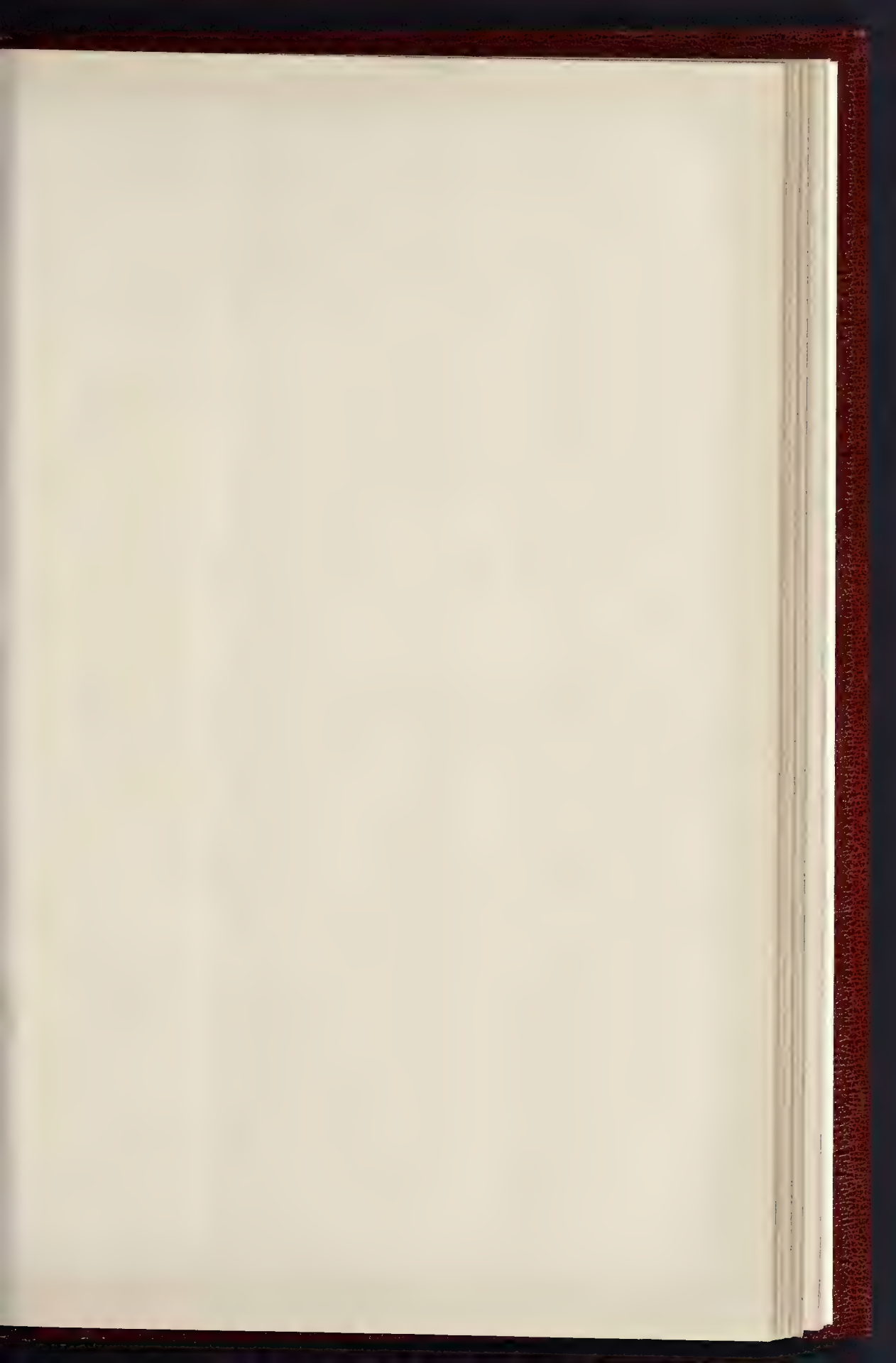


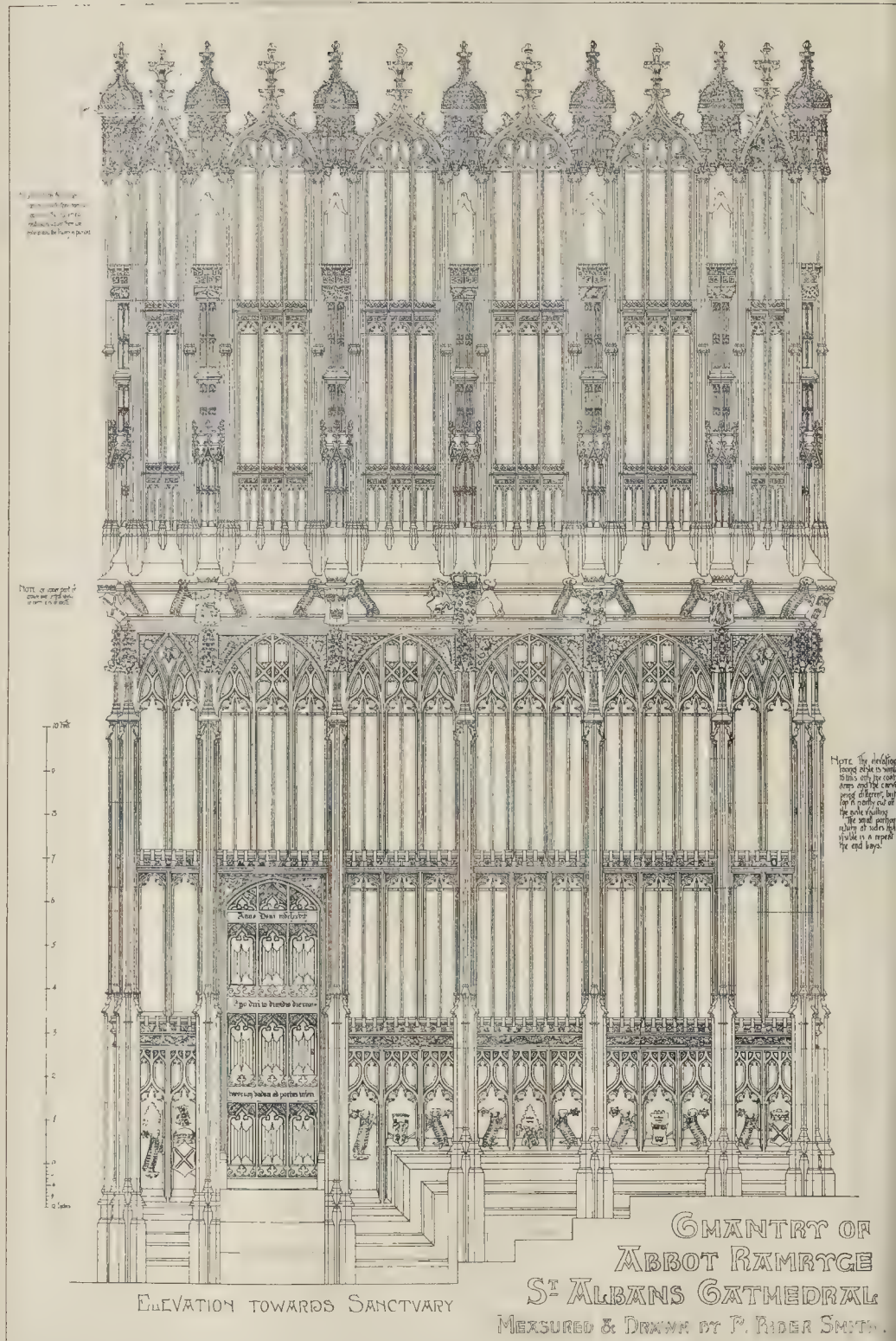


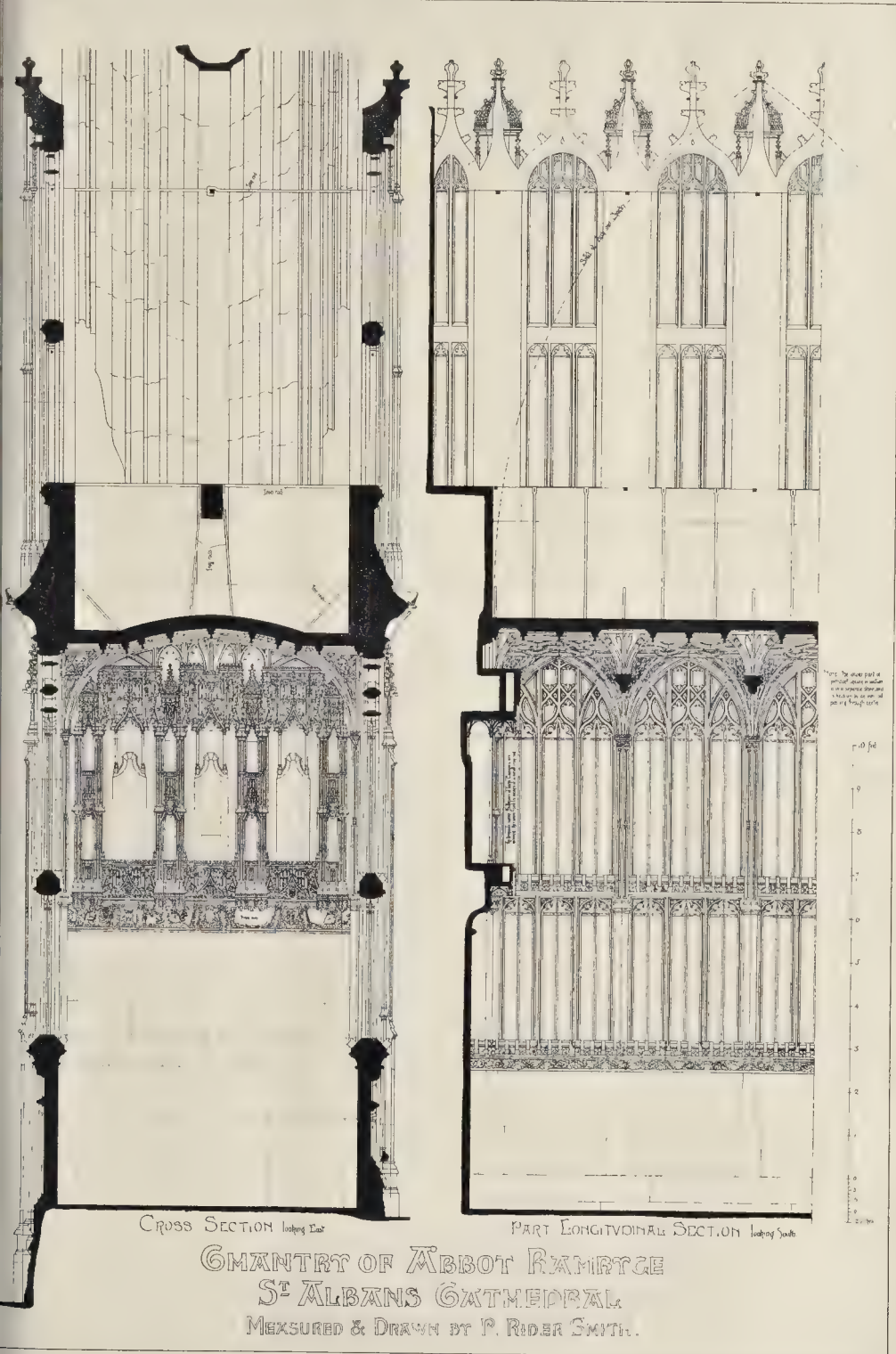


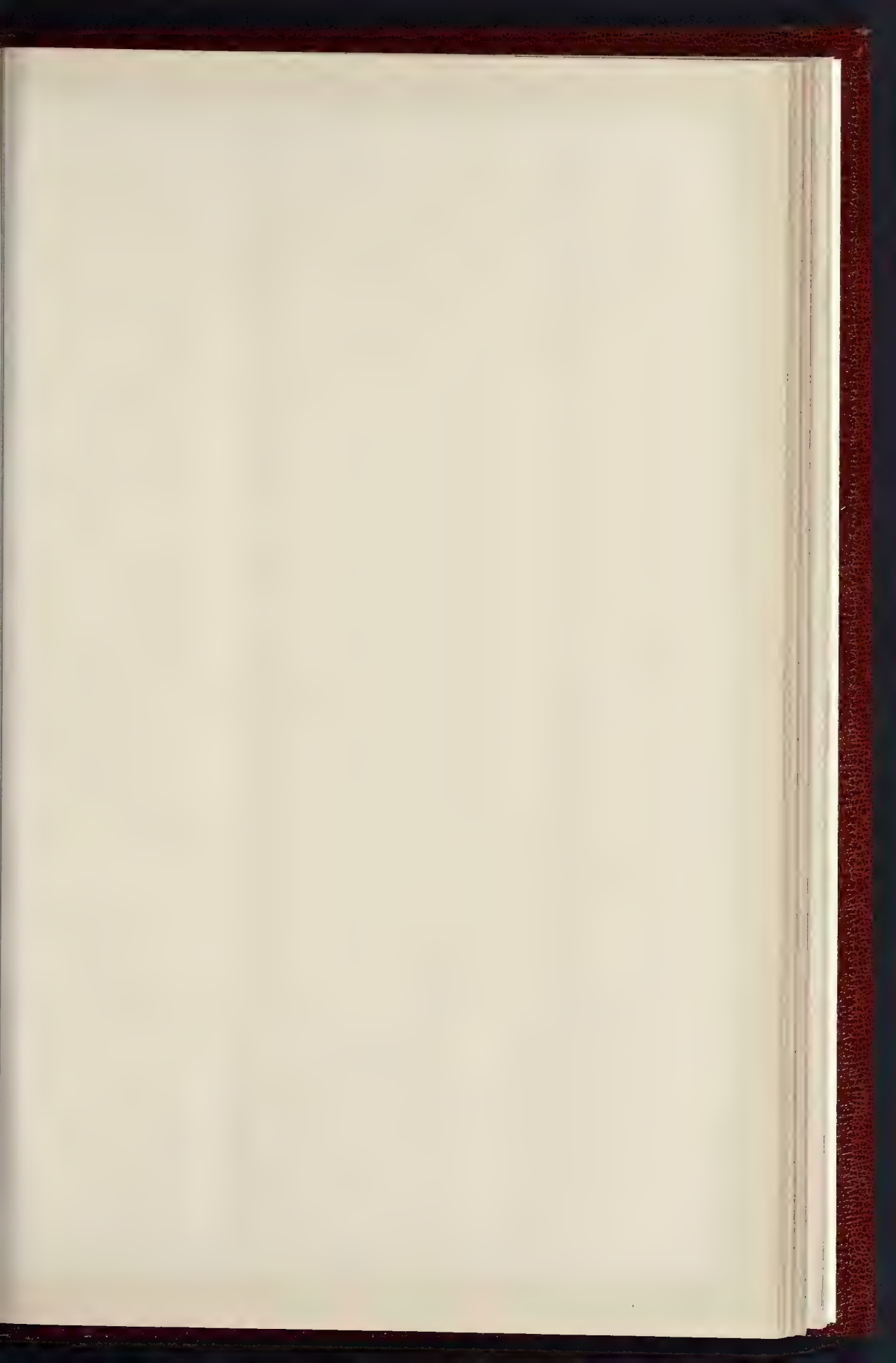


CENTRAL HALL AND PUMP ROOM, NEW BATHS, HARROGATE.—MESSRS. BAGGALLAY & BRISTOWE, ARCHITECTS.







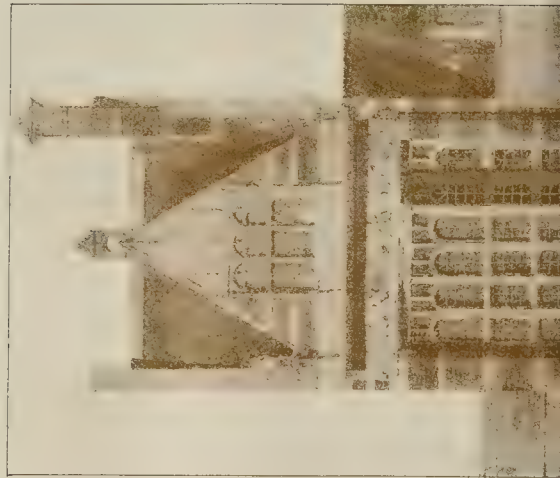


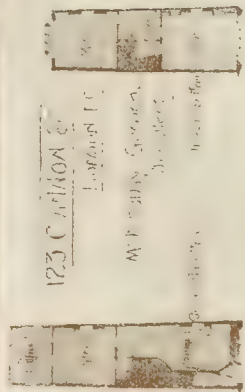
THE BUILDER, NOVEMBER 30, 1895.

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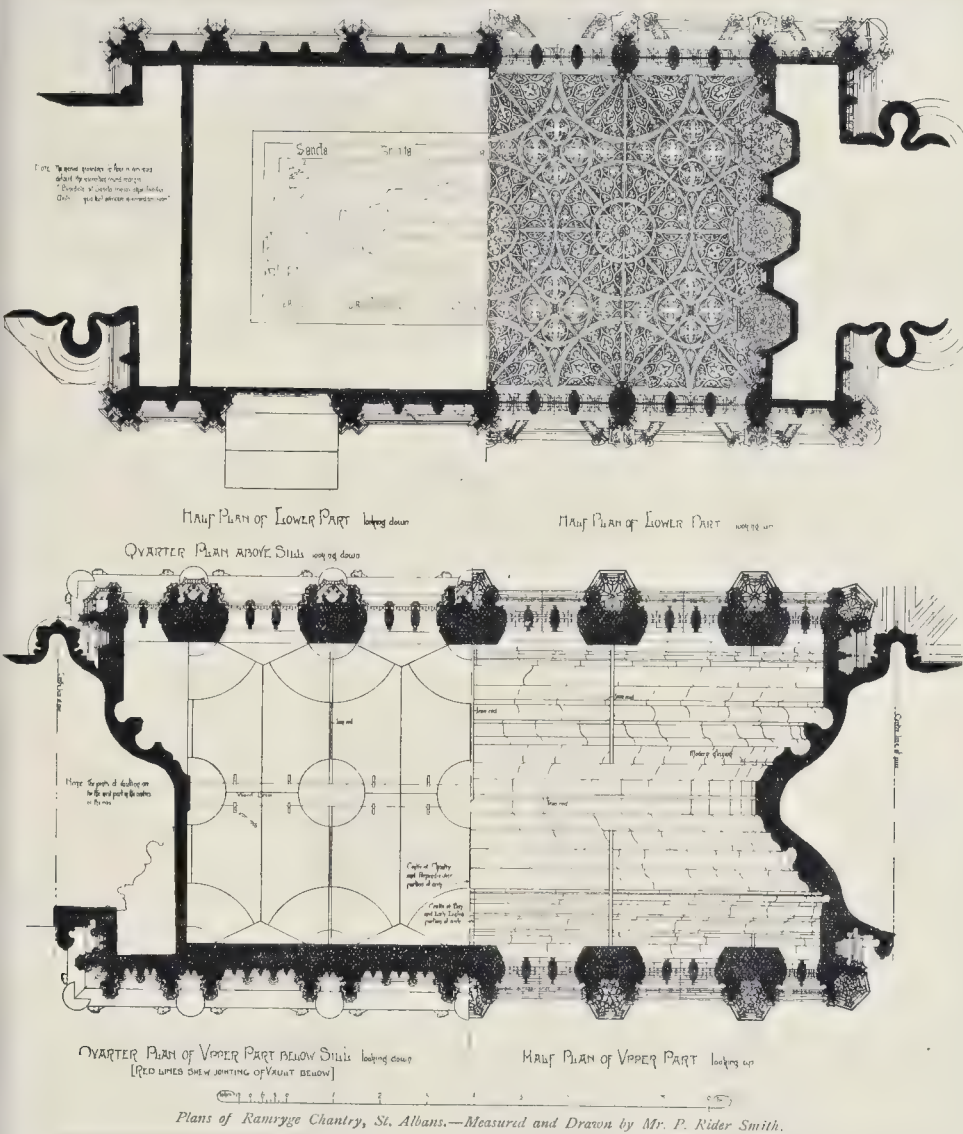
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THE PHOTOGRAPHIC RECORD OF THE BUILDING



Plans of Ramryge Chantry, St. Albans.—Measured and Drawn by Mr. P. Rider Smith.

Chartered Accountants. The architect has intentionally adopted a style and material as far as possible differing from that of the Institute of Chartered Accountants, so as in no way to clash therewith.

The front is built with hand-made red-bricks, six to the course, and with special grey terra-cotta made by Mr. S. H. Leech, of Harroway Works, Battersea. The architect has aimed at obtaining a building of subdued colour and without the appearance of newness.

The building has been erected for the Ocean, Accident, and Guarantee Corporation, Limited, and contains over 100 offices; there are two basements, and in the lower one the Stock Exchange official list is printed.

The building throughout is of concrete and steel reproof construction. The principal internal feature is the marble staircase, which has been executed by Messrs. Farmer & Brindley; the entrance-hall, which forms part of the scheme, was illustrated in the *Builder* of June 22 of this year.

The treads and risers throughout are of Piastraccia marble, the wall-filling up to the top of the dado is of "Verte di Ferrato," the remainder of the filling

is of alternate bands of "Pavonazzo" and "St. Ambrosia di Verona," 9 in. and 3 in. wide respectively; the balustrading is of wrought-iron work and brass, by Messrs. Jones & Willis. In addition to the principal staircase, there is a subsidiary one, and the floors are served by Messrs. Waygood's lifts, on their patent water-saving principle, by which the amount of water used is proportionate to the number of people raised.

The buildings were erected by Messrs. Perry & Co., from the designs of Mr. H. Huntly-Gordon.

123, CANNON-STREET.

This building is the property of the architect, Mr. H. Huntly-Gordon, and was built by him for his own offices. The front is built in red-rubber brickwork and grey terra-cotta, and the interior is fitted in a unique manner, especially Mr. Gordon's private office.

CHANTRY-TOMB OF ABBOT RAMRYGE, ST. ALBANS CATHEDRAL.

THIS fine example of Perpendicular work was erected early in the sixteenth century as the chantry-tomb of Thomas Ramryge, thirty-seventh

abbot of the Abbey of St. Albans. Very little is known about him, all the records of his rule and work having been lost or destroyed. He was elected Abbot in 1492, eight years after the death of his predecessor. The date of his death is uncertain, but was probably about 1523, when Cardinal Wolsey was appointed Abbot. Weever says "He was a pious man, beloved of God and man, and his name was celebrated for his good works to posterity." The arms borne by Abbot Ramryge were:—"Gu. on a bend or between in chief a lion rampant and in base a ram couant arg. attired or three eagles displayed vert armed of the first." This occurs on several of the shields in the lower panels impaled with the Abbey arms.

The chantry, built throughout of the soft stone known as "clunch," contains a profusion of delicate carving which, where not mutilated, is as sharp as when executed. The fan-vaulting is supported by iron rods fastened to a timber-beam which spans the bay of the choir, under which the chantry is situated; the upper part is also stayed by iron rods built into the masonry of the arch.

The shields on the main cornice, in the lower panels, and also in the interior, have as supporters rams wearing collars bearing the letters RYGE, thus forming a rebus on the Abbot's name; and the same letters preceded by a ram's head are also carved on the battlements of the transom. At the top of the panelling, just above the cornice, is an inscription with quaint lettering which is commenced on the side next the aisle and continued on the opposite side next the sanctuary, as follows:—*SANCTI SPIRITVS ASSIT NOBIS GRACIA VNI SANCTE SPIRITVS REPLE TVORVM CORDA FIDELIVM ET TVI AMORIS IN EIS IGNEM ACCENDE AMEN.* The door, which is of later date than the rest of the work, is inferior both in design and workmanship; on the rails is painted the following inscription:—*Anno Domini MDCLXXVII. Ego dixi in dimidio dierum meorum vadam ad portas inferi.* The exterior spandrels of the doorway contain carvings representing the martyrdom of St. Alban and the scourging of St. Amphibalus.

The chantry contains the remains of several of the members of the Farington family of Lancashire, to whom it was granted as a burying-place on condition of their keeping it in repair, and the date 1678 on the door probably records the time of the first interment. In memory of these more recent occupants of the tomb there are painted on the lower part of the interior-walls, coats-of-arms, and inscriptions on ribbon-like scrolls.

The monumental slab of the Abbot in the floor of the chantry is very much defaced, the effigy being only just visible, and the inscription is now undecipherable, but is recorded in Chauncey's "History of Hertfordshire," as follows:—"Benedicta sit Sancta Trinitas atque Indivisa Unitas Benedicamus ei Quia nobiscum fecit misericordiam Amen." In the four corners are shields bearing the Abbey arms impaled with three eaglets on a bend, two of the shields supported by rams and two by birds.

P. RIDER SMITH.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

THE first of the winter meetings of this society took place on the 19th inst. at the old Mercers' School, 20, College-hill, previous to its demolition. A visit was also made to the adjoining church of St. Michael, Paternoster Royal.

Mr. J. Douglass Mathews here read a paper and described the church. In Dr. Sharpe's "Calendar of Wills" he had found an extract to the effect that in 1292 Taillon had bequeathed a sum of money for the maintenance of chantries, and wax for the church, and for providing shoes for the poor of London. The street now known as College-hill was formerly called "La Reole," from merchants from La Reole, near Bordeaux, who established themselves there. The second church erected on this site was built by Sir Richard Whittington. In 1411 he granted land for rebuilding of the church. In his will, made in 1421, he desired to be buried in St. Michael's Church, and he instructed his executors to sell his dwelling-house in this parish, and other lands, and devote the proceeds to pious and charitable uses. In 1432, Gerveys, a grocer, left a tenement next to the college for the enlargement of it, and also a parcel of land, with alley adjoining, on the north side of the church, for the purpose of a new burial-ground in place of the old one, in conformity with the wishes of John Carpenter, the well-known City benefactor. There was a record that the church was restored in 1630 at a cost of £120. 9s. According to Stow, Whittington was buried three times in the church: first by his executor under a fair monument; then in the reign of Edward VI., the parson of the church, thinking some great riches were buried with him, caused the monument to be broken open, his body to be despoiled of its leaden sheet, and then again buried; and thirdly, in the reign of Queen Mary, the parishioners were forced to take him up again and wrap him in lead as before, and bury him. There he quietly rested till the Great Fire of London. His burial place was believed to be at the north-east side of the church. The church and college founded by Whittington were closely associated, the master being the rector. The fifteenth century church appears to have been entirely demolished after the Great Fire in 1666. He believed the new church was built on the site of the old one, as the size of the land was almost identical. There was nothing of special interest in the design. It was similar to most of Sir Christopher Wren's churches in narrow streets, viz., the exterior was very plain,

but the tower was surmounted by one of the most graceful lantern steeples that Wren ever designed, and he greatly rejoiced that, as it was not one of the condemned City churches, the steeple might be preserved for many years to come. The interior was on the same plan as many of the smaller City churches. It was entirely remodelled about thirty-five years ago in an excellent manner by Mr. Butterfield.

The company then returned to the old Mercers' School, to inspect some old pewter vessels lent by Alderman A. R. Rayden, J.P., and photographs of pewterers' marks, which were displayed on the walls. The Master of the Mercers' Company, the Rev. — Sutton, presided.

Mr. Charles Welch read a paper on "Old Pewter Vessels," and said the interesting specimens before them were kindly lent by Mr. Alderman Rayden; they were dredged up from the bottom of the sea off Birchington, early in the present year, north of the Reculvers, inside the last buoy; the two smaller specimens being found within the larger one. During their stay in the water, the maker's marks had become defaced. The practice of the Pewterers' Company differed from that of the Goldsmiths', which required all goods exposed for sale to be brought to Goldsmiths' Hall to receive that company's stamp or hall mark, but it was only affixed to the better class of pewter ware, as far as he knew. The compulsory registration of makers' marks was enjoined by an Act of the 10th of Henry VII., A.D. 1504. The British Museum has nothing to approach in antiquity the vessels then exhibited before them, and among the specimens in the Guildhall Museum there were very few of so early date. These vessels were provided with lids, although the larger one is now only perfect in this respect; this one holds six pints, and is 11 in. high. The handle is of very graceful shape, and very ornamental. The next vessel is a miniature copy of the above, minus the lid, and evidently the work of the same maker, and holds a quarter of a pint. The third specimen is still more defaced, the whole of the upper portion being missing, and nothing but the lozenge-shaped attachment remaining to indicate the handle which it once possessed. It originally held half-a-pint. It was difficult to fix a date to these fine jugs. That they were made long before the compulsory system of marking became law in the year 1504, there can be little doubt. The character of the ornament, and the freedom of the decoration suggest the end of the thirteenth century, or the early part of the fourteenth as their probable date. With them was also found a brass lacquered bowl, which, although it has evidently been submerged many years, is comparatively recent date.

Mr. John Watney next read a paper on "The History of the old Mercers' School." This school, it will be remembered, is the oldest existing school in London, and is governed by the Mercers' Company, its founders. It originally stood adjoining the Mercers' Chapel in Cheapside, of which building it formed a part, and was removed to College-hill in 1808. Many eminent men have been educated within its walls. It is about to be pulled down, as a new school building, having accommodation for 300 boys, has been recently erected in Barnard's Inn, Holborn, which was opened last year by Earl Selborne, a member of the Court of this Company. A description of these new schools appeared in the *Builder*, September 15, 1894, page 194.

THE LONDON COUNTY COUNCIL AND THE SESSION OF 1896.

THE "General Powers" Bill promoted by the Council relates to several objects, some of which we may enumerate as coming within our own province. For an improvement of the eastern approach to Lambeth Bridge they propose to acquire, by purchase or compulsion, a part of the churchyard of St. Mary's, Lambeth, together with a site bounded by High-street, Ferry-street, Lambeth-road, and the Albert Embankment; and to close Bunyan-place (which commemorates the meeting-house, near the parish church, in which John Bunyan is said to have preached): a similar improvement is to be made in respect of the southern approach to Wandsworth Bridge. High-street, Plumstead, will be widened, on its north side, by taking a portion of the parish churchyard: for a coroner's court and mortuary a site is scheduled at the rear of Devonport and Thornfield-roads, Hackney. The site of the "White House" tavern will be added to the open space known as Hackney

Marsbes; and certain lands are marked at Streatham (Babington-road) and Shepherd's Bush (Uxbridge-road) for fire brigade stations, and in Devonshire-street, St. Mary, Newington, for a gas-meter testing station. They also seek for an extension of time, now limited by the London Open Spaces Act, 1893, for the compulsory purchase of land in connexion with the acquisition of the York Water Gate (Buckingham-street), and the improvement thereof as authorised by that Act, and for a removal of the statutory restriction against the playing of music on any part of Highbury Fields. The Council's "Tramways" Bill provides for the construction of three tramways, in St. John's, Westminster, and Lambeth, to run to Upper Kennington-lane from the south-eastern end of Vauxhall Bridge-road, from Vauxhall Cross, and from the Albert Embankment. The gauge of these will be 4 ft. 8½ in., and the motive power that of either animals or electricity. Advertising to our "Notes" (pp. 373-4 *ante*) upon the annual report of Mr. O. Claude Robson, District Surveyor, we find that the Council have drawn up a Bill to provide for the admission of sewage from Kilburn, Mapesbury, Kensal Green, and Harlesden—being parts of Willesden District adjoining the County of London—into the Metropolitan Main Drainage System; and to deal likewise with the sewage of any other part of the Willesden District that lies south of the summit-line or watershed dividing the waters flowing into the Brent Valley from the waters flowing towards the Thames. The Bill will prohibit the discharge of sewage from any part of the District into the Council's system otherwise than as stated above; it confers on the Council powers to prevent the same and power to enter upon and inspect any sewage works, sewers, and drains within the Willesden District, and to break up and open streets and roads therein; and will provide for the payments, annual or otherwise, by the District Council to the London County Council in respect of these matters, as well as of the District Council's past and future use of the Metropolitan Main Drainage System.

THE PROPOSED BUILDERS' CLERKS' INSTITUTION.

A MEETING of the proposed Builders' Clerks' Institution of Great Britain was held on Saturday last at the Westminster Town Hall.

Mr. A. J. Gomme took the chair, and after a few remarks he called upon Mr. J. P. Bowditch, secretary *pro tem.*, to read the following prospectus which had been drawn up relating to the Institution:—

"It has long been felt throughout the United Kingdom, that the clerks engaged in the building trade have been urgently in need of an Institution of this kind; and it has now become a fact that the Institution has been definitely formed. The principal aims and objects of the Institution are as follows:—

1.—That the Institution will be for the mutual help, protection, support of interests, collection of knowledge as to state of trade, and to be of general benefit to all clerks engaged in the building trade throughout the United Kingdom; that those desiring a change can receive practical advice as to the state of trade in any part of the country; and to uphold the status of builders' clerks in general as to their special abilities in being skilled clerks, which places them in an entirely unique position as regards other classes of clerks.

2.—That a register shall be kept of all members out of employment, so as to facilitate their endeavours in obtaining situations whilst under notice or directly after, and also a register for employers who are requiring clerks to fill vacancies that they may have in their offices. The register will be accessible to both employers and members. The principal value of the register to employers will be to give them much less trouble and a greater certainty than heretofore by advertising, &c., to obtain an efficient and suitable man for their particular vacancy at an equitable wage with fair hours of employment, and to provide that every member, before being allowed to enter his name on the register, shall be of good character and efficient in the particular branch of the trade he describes himself suitable to fulfil.

3.—That head-offices shall be in London with branches in large central districts.

4.—That after offices have been obtained in London it is proposed that lectures and courses of instruction shall be given for members only, and examinations to be held periodically to test the abilities of those attending such classes.

5.—It is also proposed to form in connexion with the Institution a permanent sick benefit society and a distress fund for members when out of employment through no fault of their own.

6.—It is wished to be distinctly understood that this Institution is not formed in anyway antagonistic to employers, or as a trades union, but only for the

ideas previously stated; principally to keep up the status of the calling of this particular body of clerks, to assist men in making themselves more efficient, and for the general assistance of the members of the Institution. It will be the intention as far as it is known and practicable that only builders' clerks of good character shall be allowed to become members of this Institution."

A discussion then took place on some of the above-stated aims of the Institution. Several speakers desired to know if clerks employed in sectional trades—masons or slaters, for instance—would be eligible for election, and considerable difference of opinion appeared to exist on that point. It was pointed out that, seeing that in the north the building trade is divided into sections, the Institution could not exclude men engaged in the separate branches. They could not, in fact, make a rule for the southern counties and another for the northern. The only exception they ought to make was with manufacturers' or merchants' clerks. This seemed to be the opinion of the meeting, though Mr. H. G. Cottrell, a member of the Committee of the Birmingham Builders' Clerks' Association, said that they had decided in Birmingham to admit into their Association only men who were all-round clerks-of-works. After further discussion it was decided to leave the Committee to consider the question.

It was then proposed and agreed that the prospectus be adopted, after which Mr. Bowditch stated that he had already received seventy applications for membership. He also explained that it was hoped that the proposed lectures would be given by practical men, and that it was decided that if Clause 5 of the prospectus would clash with the excellent work which was being carried on by the Builders' Clerks' Benevolent Institution it would be dropped. In any case the Institution which they were forming could not attempt to start a sick benefit society for several years to come.

An informal discussion then followed, after which the meeting separated.

We cannot refrain from expressing the hope that future meetings of the Institution will be carried out in a more business-like manner, and that the proceedings will be commenced at the time advertised, and not an hour or more later.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION:

ELECTION OF PENSIONERS.

A SPECIAL general meeting for the election of two pensioners took place on the 26th inst. at the offices of this charity, No. 21, New Bridge-street, Blackfriars, Mr. E. C. Roe (Messrs. George Trollope & Sons) presiding, in the unavoidable absence of Mr. Charles Wall, the President. The election was a contested one, there being three candidates, viz., Mrs. Sophia Lovett, who polled 1,014 votes, Mrs. Helena Bishop polling 916 votes, and Mr. Jas. T. Cough 114 votes. At the close of the poll the Chairman announced that the successful candidates were Mrs. Lovett and Mrs. Bishop.

The amount of the widow's pension is 20s. per annum, and there are now (including the two widows just elected) twenty pensioners on the books. Votes of thanks were passed at the close of the election to Messrs. James Aynsley (Messrs. Carter & Aynsley), H. W. Parker, and James A. Robson, for their services as scrutineers, and to Mr. E. C. Roe for his able conduct in the chair.

THE GLASGOW BUILDING TRADES EXCHANGE.

THE first of the series of papers on subjects relating to building was delivered on Thursday last week, in the Building Trades Exchange, Gordon-street, Glasgow, by Mr. Keppie, of the firm of John Honeyman & Keppie, architects. Mr. Keppie gave a short résumé of the work the Exchange had done during the past year, and indicated new developments, which are intended to take place during the coming year. He called special attention to the sample department, which has already proved a boon, and which, were it enlarged and supplemented, might ultimately supersede the industrial exhibitions which take place over the country from time to time. The formation of a library of catalogues properly arranged, and easy of access, was also considered, and the directorate of the Exchange were agreeable that this suggestion should be carried out. The fact that all members were responsible to the directorate for the probity of their practice, and for conformity to specifications if member-

ship were to continue, was also dwelt on; also the settlements of disputes between contracting parties, without the trouble and expense of litigation, and by those who from their position had the practical knowledge necessary for such settlements, which was considered a favourable feature. After this résumé, the lecturer went on to consider some points in connection with the Glasgow mode of measuring. He said surveying was not an imaginative profession, although in some instances it seemed to be considered such. Measurers should insist on getting a sufficient time to do their work thoroughly, and a sufficiency of drawings to thoroughly illustrate the designs they were asked to survey. He urged also the advisability of coming to some understanding as to the time necessary for the completing of measurements, and the making of final payments for work done. He expressed surprise that such a scale had not up till now been drawn up, and indicated that it would be of great value to all the parties concerned. The loss involved in the breaking of such a rule should, he said, be borne by the infringers, and should not involve the contractor in the loss of the use of his money as it at present does.

A discussion followed, in which the following took part:—Mr. Goldie, Mr. Scott, Mr. Barclay, Mr. Howatt, Mr. Herberston, Mr. McGilvrey, Mr. Walker, Mr. D. Paterson, Mr. Duncann, Mr. Marshall, and Mr. Carlton.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

The Trinity Almshouses.—Dr. Longstaff presented a petition from Mr. Ashbee and Sir Walter Besant asking the Council to use its influence to prevent the destruction of the Trinity Almshouses, Mile-end-road. The petition was referred to the Petitions Committee.

Mr. Roberts, later in the sitting, asked the Chairman of the Corporate Property, Charities, and Endowments Committee whether his attention had been called to the question of the almshouses, and whether something could not be done to preserve a building of so much historic and architectural value.

Dr. Napier, in reply, said a representative of the Council would have no *locus standi* at the inquiry which was to be held, and while he sympathised with the view that the destruction of the almshouses would be an act of vandalism that ought in every possible way to be resisted, still he did not see that any good would be done by the Council sending a representative to attend at the inquiry.

The Works Committee and the Cost of Work.—The debate was resumed on the adjourned report of the Works Committee, which gave the cost of 89 works* which had been executed by the Works Department.

Mr. Ward, Chairman of the Committee, said that he wished to say that the statement made last week by Sir John Lubbock, that when the work was put out to contract the lowest tender in some fifty cases averaged 6 per cent. below the architect's estimate, was correct.

Mr. Cohen, M.P., said that he wished to emphasise that point, so that the ratepayers might know that if the works reported upon had been carried out by a contractor instead of by the Works Committee there would have been a saving of about 18,000l.

Sir John Lubbock said that, as he had stated last week, had the work been given out to contractors under the old system there would have been a saving effected of 18,000l. instead of 600l. He also referred to the fact that the Committee, when it considered the architect's estimate insufficient, had the option of refusing to do the work, which was then undertaken by contractors; whereas under the old system the contractors took the works whether the estimates were high or low. He thought they ought to have a list of those works which the contractors had carried out after the Committee had rejected them, showing the architect's estimate and the actual cost of the work as carried out. He thought it would be seen from such a list that the works had been carried out at less than the estimate. While the report showed an improvement, he hoped that the Committee would soon agree that the experiment had been carried far enough, and that sufficient of the ratepayers' money had been spent.

Mr. Burns, M.P., said that with regard to Sir John Lubbock's argument, he found that twenty-eight of the jobs to which he had alluded were above the estimate. Out of fifty contractors employed five failed. There was no doubt that the quality of the work of the Works Department was irreproachable.

Mr. White supported Sir John Lubbock's contention that a good deal of money had been lost in the past, and he believed the Works Department would never be a financial success until it was entirely reorganised. He was sure they would never be able to do work at a profit such as a contractor would make. If, as some contended, they were doing it now, then the difference between total estimate and total cost, instead of being a beggarly 600l. spread out over three years, ought to be at least 45,000l. The fact, of course, was that the contractor's profit was swallowed up in spite of all the advantages with which the Works Department started. His desire was that the Works Committee should be put upon a proper commercial basis, but he could not hold out to the Council the hope that under any circumstances were they ever going to secure for the benefit of the ratepayers the contractor's profit. If the Council put themselves in communication with the best class of builders they would secure quite as good results as they would ever obtain through the Works Committee.

Mr. Ward, in replying on the debate, said in analysing the accounts to which Sir John Lubbock had referred he found that nearly all the saving, which averaged 6 per cent. on the total number of works, was upon two of the jobs. In these cases the contractors made a very great mistake, and they were unable to carry out the work. At the present time the Committee were saving 11 per cent. as against 6 per cent. in the estimate. Another point was that the Committee had taken some works for a smaller sum than contractors would take them for. The high quality of the work was admitted on all hands, and he thought the Committee were entitled to claim that they had achieved success. The report was then adopted.

The Council adjourned soon after 7 o'clock.

COMPETITIONS.

ARTISANS' DWELLINGS, KENTISH TOWN.—A competition was recently promoted by private enterprise for the best design for artisans' dwellings at Kentish Town. Forty-six sets of drawings were submitted, from among which those sent in by the following competitors were selected as the best:—1. Mr. Harry Heathman, Barnard House, Clarence-road, Redditch, Bristol; 2. Mr. C. Pickford, 14, Great James-street, Bedford-row, W.C.; 3. Messrs. A. P. Killick and H. S. Wood, 16, Basinghall-street, E.C.; 4. Mr. W. G. Lewton, 44, Queen's Crescent, Reading; and 5. Mr. Valentine L. Knight, 21, Donberg-road, Blackheath. None of these designs, however, altogether met the wishes of the promoter, and it is therefore not intended to carry any of them out.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The members of this Society visited the new Sheffield Royal Hospital on Saturday last, on the invitation of the President, Mr. Charles Hadfield, who is the architect for the building. Under Mr. Hadfield's guidance the party made a tour of inspection over the buildings. In proposing a vote of thanks to Mr. Hadfield, Mr. Wm. Parkin said that as a lay member of the Society he had seen, and especially was he pleased at the friendly feeling which the architectural profession in Sheffield exhibited. He did not suppose that in any of the local trades anyone would invite others in the same business to come and see his work.—The motion was seconded by Mr. T. H. Waterhouse, J.P., supported by Mr. T. Winder and Mr. C. J. Innocent, and carried unanimously; and on the motion of Mr. E. M. Gibbs, seconded by Mr. E. Winder, jun., a vote of thanks was passed to the board of management of the hospital for kindly throwing it open to the Society. The contractors for the building are:—Mr. Molloy, earthwork; Mr. Webster, masonry; Mr. Tomlinson, joinery; Mr. Rodgers, painting; Mr. Higgins, plastering; and Mr. Sulliffe (Messrs. Haden & Co.), warming. Mr. Buchanan, the clerk of works, assisted the architect in explaining the plans and the building.

GLASGOW SCHOOL OF ART.—A lecture on "Roman Architecture after Nero" was delivered in the Glasgow School of Art on the 25th inst.

* See the Builder for last week, page 379.

by Mr. W. J. Anderson, being the seventh of his series on the History of Architecture, and the last lecture dealing with the Classic periods. By the aid of coloured maps of the Grecian colonies and Roman Empire at different periods, the lecturer showed how Rome, situated between an ancient Italian civilisation in Etruria and a Hellenic community in Campania, had borrowed its art expression first from Etruria, and then combined it with the Grecian forms, more and more assimilated as the Empire absorbed the Greek colonies and Greece itself. The result was the golden age of Augustus or what might be styled the Græco-Roman period. In a similar way the victories of Trajan brought a similar influence from Persia and the East into Roman art, less in degree, because the occupation was of short duration and the conquest less thorough. It was during the reigns of Trajan and Hadrian that Roman architecture culminated. The works of Apollodorus at the Forum of Trajan and the rotunda of the Pantheon itself, in the early years of the second century A.D., were the high-water marks of Roman art, which, though inferior to Grecian expressions, as the Roman art instinct was to the Greek, were a most wonderful reflection of the character and genius of the people of Rome. Just as the argumentative, superstitious, envious Greek, delighting most in life and strength and beauty, had written himself down in every detail of his temple architecture, so in Rome the organising, assimilating faculty of the Romans became a substitute for natural instinct and originality, and enabled them to rear some of the most splendid and impressive buildings of the world. Were the record of the deeds and works of Rome wiped out, such buildings would themselves give as clear an idea of the nature of her supremacy as we could learn from her history or literature. Even as it is, the most vivid and trustworthy record is in the architecture for those who can read it. Altogether seven art periods were distinguished in the history of Rome; the lecturer dealt specially with the last three—the Culmination, the Romano-Greek revival, and the Eclectic and declining period, each being illustrated by diagrams and photographs bearing on the subject.—*Glasgow Herald*.

ARCHÆOLOGICAL SOCIETIES.

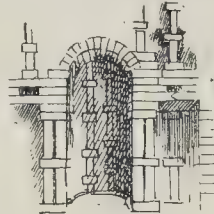
BRITISH ARCHÆOLOGICAL ASSOCIATION.—The second meeting of the session of this Association was held on the 20th inst., at 32, Sackville-street, Piccadilly, the Rev. Cave Browne, M.A., in the chair. A very interesting paper was read by Mr. Chas. R. B. Barrett, M.A., on "The Chapel of Lede or Lead in the parish of Ryther-cum-Ozendyke, Yorkshire." The Manor of Lede was in feudal times a tenancy of the honour of Pontefract, and is a detached portion of the parish of Ryther. Lede chapel stands in the middle of a field, unsurrounded by any wall. It is very small, its total length being only 18 ft. Rude oak benches line its sides, and it possesses a curious font of unusual design, apparently of older date than the building itself; there is also a dilapidated old parish chest. The chief interest of the little chapel appears to be centred in the four or possibly five body stones or slabs, each having incised armorial bearings on a shield—the arms of a long-forgotten family named Tiesci or Tyas. These four slabs lie together in a row at the eastern end, in front of the altar of the little chapel, but the altar-stone itself, marked with the five crosses, now lies on the floor, forming a portion of the pavement. Mr. Barrett illustrated his paper by some nicely-executed etchings and drawings of the slabs and the armorial bearings.—The Rev. V. H. Moyle, M.A., afterwards described the mural paintings he has recently discovered on the walls of Ashampstead Church, near Pangbourne, Berks, and illustrated his remarks by means of a large number of photographs. The whole interior of the church appears to have been decorated with paintings, and they date from different periods, being painted over each other, the oldest being of the thirteenth century. The chief subjects are the Crucifixion, the Overshadowing of the Blessed Virgin, the Visitation, the Nativity, and the Angels' Message to the Shepherds, and the Sunflower or Glory at the east end of the nave. These interesting paintings were thickly covered by coats of yellow wash, and are now gradually being revealed, after very careful and patient scraping, which Mr. Moyle himself is doing as opportunities allow. The discovery was made accidentally through the falling of a portion of the sham plaster ceiling in May last, owing to injury done to the roof by the severe weather of last winter.

Correspondence.

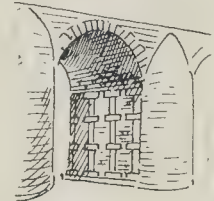
To the Editor of THE BUILDER.

SAXON "LONG AND SHORT" WORK.

SIR,—In connexion with the deeply interesting series of articles on "Saxon Architecture," now publishing in your columns, may I draw the attention of your readers to a paper on the subject by Sir Gardner Wilkinson, in the "Lincoln Diocesan Architectural Society's Volume for 1863-4," where he says:—"Whether the Saxons derived their mode of building direct from the Romans (in Britain) or indirectly from them it is plain that like its contemporaries, the Romanesque and the Lombard, the Saxon style was indebted for its characteristic and general



Semicircular apse built into the Roman temple of Dugga, Tunis, after its conversion into a Christian Church in the time of Justinian.



Bridge of late Roman date, Sufetula (now Sbeitla), Tunis.

features to the debased Roman architecture that preceded it, and I am inclined to think it was directly borrowed from it, as we find in no other architecture all the local peculiarities which distinguish it. The pent roof or triangular-headed arch so common in Saxon buildings was also derived from the Roman."

Your learned correspondent, Professor Brown, as I read him, appears to question the use of

Internal corrosion of cast-iron water-pipes.

No.	Age of pipe.	Internal diameter of pipe.	Amount of rust, per lineal yard.	Capacity of clean pipe, per lineal yard.	Percentage of space occupied by rust.
	Years.	Inches.	Cubic inches.	Cubic inches.	
1	20	3	0.184	254.44	25.0
2	29	3	86.94	254.44	34.1
3	38	3	110.44	254.44	43.4
4	29	4	182.37	452.37	40.3
5	22	4	244.37	452.37	54.0
6	14	5	150.00	716.56	25.4
7	15	7	190.00	1,185.42	13.7
8	15	10	240.00	2,827.44	8.4
9	40	25	1,320.00	6,361.74	20.7

"long and short" work by the Romans, but two of the illustrations (copied overleaf) accompanying Sir G. Wilkinson's paper prove conclusively that they did occasionally employ it in at least one of their colonies.

G. H. ROWBOTHAM.

THE DISCUSSIONS AT THE INSTITUTE.

SIR,—I think it is to be regretted that the system of the Chairman calling on members to speak in the discussions, which was for a good while discontinued, appears to have been resumed as a regular practice. The natural result is that those who are not called upon from the Chair, especially if they are among the younger and less-known members, feel as if they were intruding in offering their remarks, and that we may thus lose observations which would be of interest.

It is impossible, except from some previous communication, that the Chairman should know what members have anything special to contribute to the discussion, and this was rather curiously illustrated at the last meeting (Mr. Murray's paper),

when the two first gentlemen called on by the President practically admitted that they had nothing to say. The time they occupied in telling us so might possibly have been more profitably occupied by others who had something to say but could not get the opportunity, or who did not like to speak without being asked. I do not make the remark from any knowledge of such a case, but merely as suggesting a possibility.

Our present learned, courteous, and much-respected President is a gentleman who is so little likely to desire to impose his own rules on the conduct of a discussion, that we must conclude that the system of calling on speakers is favoured by the Council, and there may be reasons for it which outsiders do not realise. But it seems rather a bar to "free discussion," in the full sense of the word.

"ONE WHO IS NOT DESIROUS TO SPEAK."

AN APPEAL.

SIR,—For more than fifty years the Ragged School Union, in connexion with its 212 affiliated local centres, has been in contact with the members of the building trades. It also has a number of them—employers and *employés*—among its 6,000 voluntary helpers. I should, therefore, be glad if, in the *Builder*, you would allow me to state that we are now urgently in need of funds for meeting the varied needs of our 50,000 *protégés*. They are by us not only relieved, but trained throughout the course of their boyhood and girlhood in those habits with the aid of which they, instead of growing up helpless and useless, become able-bodied, clear-minded, and well-tutored citizens—helpers, not burdens on the community.

The smallest as well as the largest donations will be gratefully received. JOHN KIRK, Secretary.

Ragged School Union,
37, Norfolk-street, Strand, London, W.C.

The Student's Column.

METALS USED IN BUILDING.—XXII.

DURABILITY (continued).

THE internal corrosion of cast-iron water-pipes is an important subject, concerning which we have yet a great deal to learn. Such "corrosion," as it is familiarly termed, may consist merely of an incrustation of mineral matter inside the pipes whereby the pipes are coated; or it may also in part be formed by the decay of the iron, to the detriment of the life of the pipe. Apart from the question of durability, we find the evil effects arising therefrom are—(1) loss of water-carrying space, and (2) loss of pressure. Elaborate investigations on this subject have been carried out, amongst others, by Mr. M. B. Jamieson, with special reference to the water-pipes of the City of Aberdeen.* To give some idea of the amount of such corrosion we may quote the following table from Mr. Jamieson's researches:—

The column headed "Age of Pipe" refers to the length of time the pipe had been placed in the ground prior to the investigations being carried out; the "Amount of Rust per Lineal Yard" was ascertained by filling the pipe with water, noting the quantity, deducting it from what the pipe should contain when clean; the remainder giving the required result. Nos. 1 to 6 refer to uncoated pipes; Nos. 7, 8, and 9 to pipes coated with asphalt. The effect of the coating is sufficiently marked, though we should not forget that so far as internal deposition (as distinct from oxidation of the iron) is concerned, the diameter of the pipes is an important factor. Nevertheless, it is remarkable that a pipe fifteen years old, with such water as is served to Aberdeen, should only have 8.4 per cent. of space occupied by the rust.

Another peculiar circumstance, not brought out, however, in the foregoing table, is that with a pipe of the same diameter the approximate amount of rust per lineal yard is in proportion to the age

* Consult "Min. Proc. Inst. C.E.," Vol. lxx. (188), p. 327.

of the pipe; at least, that holds good for pipes having a diameter of 3 in., 4 in., and 5 in. respectively.

Some attempt has been made to ascertain the effect of these internal accumulations on the strength of cast-iron pipes. A question of this nature it is next to impossible to solve definitely, because the contact of the outside of the pipe with the more or less damp earth in which it is buried leads to decay of the former externally in the majority of instances. In the case of the Aberdeen pipes referred to, it was found difficult with uncased pipes to decide whether the strength of the pipe was affected more by the internal or by the external rust; but on inspection the inside of the pipes appeared to be in better condition than the outside, after the rust had been removed.

The chemical composition of the internal rust found in pipes through which soft water flows shows it to consist of from 35 to 40 per cent. iron oxide, from 40 to 43 per cent. insoluble sandy matter, the remainder consisting chiefly of volatile substances. This could not possibly be harmful to the quality of the water passing through; on the contrary, the mere fact of the deposit having taken place is to some extent indicative of the water being purified during its passage.

With hard water, no doubt, the principal mineral matter corroding such pipes would be carbonate of lime, and this would be mixed with a certain amount of iron from the substance of the pipe itself. On the coating once being formed it would act as a preservative, and if the pipes were constantly cleansed they would, in consequence, be liable to decay much more rapidly. As an illustration of the fact that rust-corrosion is proportional to the volume of water passing along a pipe and the commotion existing therein, it may be stated that whilst main-pipes, through which water is constantly passing, are often nearly filled with rust, their fire-cock branches through which it seldom flows (though they are constantly full) are comparatively clean.

Incidentally, we have referred to the rusting of cast-iron pipes in contact with earth. It is obvious, however, that the class of earth in which the pipes are embedded is a ruling factor in such cases. Where solid rock is excavated, it is well to ram pieces of the same rock round the pipe; the oxidation then taking place is only that induced by rain-water or leakage from the pipes themselves. If the pipes are buried in clay, we may be tolerably certain they will always be kept damp, especially in a low-lying situation. But it does not follow that, externally, they suffer much in consequence, as there is very little circulation of water in stiff clays, they being for all practical purposes impervious to water. On being laid in such a substance as chalk, the iron would have to be of very poor quality to become much damaged even through a number of years. In sand, however, and especially in gravel, they may decay rapidly, and on being dug up are often encrusted by compact stones and sand bound together by iron derived for the most part from the destruction of the pipes.

We will not go into the subject of the corrosion of boilers to any length. Everyone knows that boiler incrustation is induced to form primarily through the employment of hard water—water containing either the carbonate of lime or magnesia, or both. The scale is therefore lessened by softening the water. But certain forms of incrustation are really corrosion, the boiler-plates being ultimately destroyed, principally through the agency of acids whose power to do chemical work is enormously increased in such high temperatures. Professor August Wagner found* that both at ordinary temperatures and at the boiling-point, the presence in water of dissolved chlorine in such combinations as chloride of magnesium, of ammonium, sodium, barium, potassium, and lime is very destructive to the iron as soon as air is admitted. From this it follows that the addition of chloride of barium to feed-water is likely to be injurious to the boiler. The evaporation of spring water has less deteriorating influence than pure water, especially when by evaporation of the former a thin preservative layer of carbonate of lime is thrown down upon the iron. Of course, if the calcareous deposit becomes very thick it must be removed. Chloride of ammonium and sal-ammoniac solutions are especially to be avoided. The addition of oil or fat to the feed-water is not injurious to the iron, whilst it exercises a preservative influence against rust; but at higher temperatures than 212 deg. Fahr. it is probable that the fat or oil has an injurious effect. In this connection it may be observed that acid oils for

lubrication are generally credited with being the prime cause of the formation of lumps inside the cylinders of steam-engines; but Mons. A. Mercier found† that fatty oils, even if perfectly neutral, have a strongly corrosive action on iron in the presence of steam. He recommended the use of mineral oils, thickened, if necessary, with wax or paraffin, for the lubrication of the parts of engines working in steam.

In regard to the durability of zinc, although that metal oxidises more rapidly than iron, the oxide adheres with such tenacity to the metal that it affords efficient protection against the continuation of the process. To this property the metal owes whatever durability it may possess, the more so that its oxide is not soluble in water. In presence of any solvent of the oxide, zinc decays so rapidly as to be practically worthless. In pure water its durability is very great; the sun's heat is, however, peculiarly destructive to it, on account of its liability to greatly expand or contract during changes of temperature. Mr. Edwin Clark remarks‡ that the most important cause of the destruction of zinc in smoky districts is galvanic action. In such situations the particles of soot or carbon deposited on the zinc form one element, and the zinc itself another of a powerful galvanic couple; whilst the sulphurous acid and moisture of the atmosphere complete the battery, or rather the myriads of batteries, which cover the surface of the zinc plate. The durability of alloys of zinc are modified as they are made of more or less durable minerals than zinc. In certain cases it would appear that the perfect employment of the zinc engaged in the alloy practically neutralises that metal. If alloyed with iron the iron predominates; if with lead, the lead governs relative durability. That is, always providing that reasonable proportions of the iron or lead are used in the alloy.

The corrosion of zinc by water, and various saline solutions, have been carefully investigated by Mr. H. Snyder, who found that zinc decomposes both dilute and concentrated saline solutions without the intervention of free oxygen; water being decomposed with the formation of zinc oxide and liberation of hydrogen. Zinc oxide is soluble in 1 per cent., and even weaker saline solutions, the amount dissolved varying with different salts, being highest with those of ammonia. Both the hydrated oxide and carbonate of zinc are insoluble in carbonates. Zinc is more rapidly attacked when the solution contains oxygen free from carbonic acid, which has a direct oxidising action. In this case the saline solution only serves to renew the surface of the metal by dissolving away the oxide as it forms. On the other hand, the action of carbonic acid as contained in air has a slightly retarding tendency, due to the formation of a film of basic carbonate on the surface of the metal. The corrosive and solvent action is greatest with solutions of chlorides and sulphate of potassium, and less so with alkaline and barium nitrates and sulphate of magnesium. In all cases the solvent action increases with increase of temperature; at the freezing point of water it is very small. It is noteworthy that hard well-waters are without action on zinc, even when containing a considerable proportion of chlorides and sulphates. Soft waters, on the other hand, show a considerable solvent power, which increases in proportion as the sulphates and chlorides exceed carbonates and phosphates held in solution. This is another example of the corrosive power of soft water.

Lead is a most indestructible metal. It is not appreciably worn away by friction, though it practically flows under the tread. Lead-pipes used at Pompeii for fountains and baths have not suffered deterioration, in spite of their having been buried for centuries. Nevertheless, lead slowly absorbs oxygen and carbonic acid in moist air, and is acted upon by certain waters, as explained when dealing with the subject of lead-pipes and their effects on the quality of potable water. Its great ductility renders it useful for a multitude of purposes, but that same property is in some instances a drawback. The bursting of lead-pipes during frost would not be such a frequent phenomenon were it not for the facility with which the metal moves, molecularly, under pressure. The durability of such pipes is to a large extent dependent on their thickness and the relative purity of the metal.

In regard to copper, that also is a very durable metal, even more so than lead, though in a moist temperature it slowly oxidises, and a green

carbonate forms on its surface. Paint adheres to it more permanently than it does to lead or zinc. The action of sea-water on copper used to protect submarine structures, in the form of sheathing, is important. The prime object of covering piling with copper is to prevent the adhesion of barnacles and the like to the substance covered. It is commonly supposed that the effect of sea-water on the copper produces some poisonous fluid which kills the crustacea alluded to; but that is not the case. The copper affords protection by the very fact of its decay. Barnacles adhere to it as freely as they do to either zinc or iron; but the chloride of copper which forms beneath the attachment being a soluble salt, the animals no sooner find a lodgment than they are set free by their own solvent power.

Brass and bronze, when of good quality, are as durable as copper; but the former is frequently adulterated to such an extent by iron, or is merely iron, coated with brass, that brown rust stains soon put in an appearance. Aluminium is remarkable for its durability. It does not oxidise in the air, or combine with sulphur; it is insoluble in cold nitric acid and in sulphuric acid; but hydrochloric acid and alkalis readily dissolve it. For all practical purposes, therefore, it is one of the most durable substances known. Nickel does not readily oxidise in air at ordinary temperatures, but when heated monoxide is formed. On the other hand, manganese oxides more readily even than iron, and must, therefore, be excluded from air as far as possible. Tin is not much affected by air at ordinary temperatures, for which reason it is so extensively employed in covering iron-plates so as to preserve them; neither is antimony, but when heated in air antimonious oxide is formed.

GENERAL BUILDING NEWS.

CHURCH SCHOOL, BARKISLAND, HALIFAX.—A new church school, designed by Mr. W. Swinden Barber, of Halifax, has just been completed at Barkisland. It consists of two rooms, one 35 ft. by 21 ft., the other 18 ft. by 16 ft., and a lobby 18 ft. by 8 ft., all opening into each other.

KNOT MILL STATION IMPROVEMENT, LANCASTER.—Considerable progress has been made during the past few months with the new station buildings at Knot Mill, near Manchester. The main entrance will front Deansgate. The design is Gothic in style, and the material used is red brick, with carved stone facings. The building will be surmounted by a clock-tower. From this entrance—which is faced externally with dark-brown brick and a tiled and brown dado—there is a slight incline, leading by an easy flight of steps, 15 ft. wide, into the booking-hall. To accommodate vehicular traffic, the approach will be from Gaythorn-street to the booking-offices by an incline of about 1 in 20. In front of these offices there will be a large awning, with wide footpaths on each side of the roadway. There will also be a shelter for cabmen. After leaving the booking-hall, a slight ascent and a wide staircase bring the passenger to a subway, from which the platform is reached by an easy flight of some nineteen steps. The platforms will be considerably widened, and raised so as to be almost level with the steps of the carriages. On the Bowland side there will be a general waiting-room, as also waiting-rooms for the various classes of passengers, with ante-rooms and other conveniences. On the Deansgate side are the stationmaster's offices, ticket collectors' rooms, and ladies' and general waiting-rooms. The platforms will be covered, the roofing being of steel work. The street running parallel with the Rochdale Canal is to be widened 75 ft. The new buildings are from drawings provided by the joint engineers of the London and North-Western and Manchester, Sheffield, and Lincolnshire Railway Companies (Messrs. Francis Stevenson and Alexander Ross), and the contractors are Messrs. R. Neill & Sons, of Manchester.

RESTORATION OF PARISH CHURCH, HINDERWELL, YORKSHIRE.—St. Hilda's Parish Church, Hinderwell, has been restored and re-opened. The cost amounts to about 1,000l., and the work has been of a comprehensive nature, comprising new roof, new floor, new windows, and new heating apparatus. The interior is also entirely re-seated. The pulpit has been erected to the memory of the late Mr. John Corner, father of the present Rector. An apse has to be built at the east end, when the requisite funds are forthcoming. The architect is Mr. R. Lofthouse, Diocesan Surveyor, and the principal contractors are Mr. H. Harland, Whitby; Messrs. Punch Bros., Middlesbrough; Mr. Jefferson, Hinderwell; Messrs. Musgrave, Belfast; and Mr. J. Stephenson, Whitby.

BAPTIST CHAPEL, PENARTH.—The opening of the new Tabernacle Baptist Chapel, situate in Plassey-street, Penarth, took place recently. The cost of the whole building was 3,000l. The contractor was Mr. D. G. Price, of Penarth, the buildings being designed and carried out under the supervision of Messrs. Jones & Thornley, architects and surveyors, Cardiff.

* "Dingler's Polytechnisches Journal," Bd. 218 (1873), pp. 70-79.

* "Annales des Mines," 1879, p. 234.

† "Min. Proc. Inst. C.E.," Vol. xxvii, (1888), p. 560.

‡ "Berg- und hüttenmännische Zeitung," Bd. xxvii, (1873), p. 225.

NEW WING, THE ROTUNDA HOSPITAL, DUBLIN.

—The new Thomas Plunkett Cairns' wing of the Rotunda Hospital, Dublin, has just been opened. Mr. Albert E. Murray, Dublin, was the architect for the extensions. The new wing is three stories in height, has a frontage towards Rutland-square of 100 ft. with two wings, each about 70 ft. deep. The material used in its construction is red brick, relieved by yellow terra-cotta around the entrance door and windows. The ground floor is provided with waiting and consulting rooms, housekeepers' and sitting rooms, and dormitories for ward-maids. The upper stories are reached by hydraulic lift. On the first floor are situate two wards, measuring 65 ft. by 25 ft., and each furnished with sixteen beds, while branching off the connecting corridor are several smaller wards. Each ward has attached to it a sanitary annexe, fitted with bathrooms, &c. Space has also been found on this floor for a kitchen and two operating theatres. The upper story is devoted to nurses' dormitories, each of the pupils-nurses being provided with cubicles, while the staff-nurses have each been assigned a separate bedroom. Hot water is supplied to all parts of the building from a boiler in the basement, and a destructing-chamber has also been fitted up in the basement for the purpose of destroying hospital refuse. The sanitary fittings have been supplied by Messrs. Maguire, of Dublin, who also erected the gas-fittings. Mr. Kieran carried out the building contract.

NEW WORKHOUSE INFIRMARY, BURNLEY.

A new infirmary adjoining the workhouse at Rake Head, Burnley, was opened on the 21st inst. The building is constructed on the pavilion principle, and is in two wings, each two stories high, with an administrative block in the centre. The structure throughout is built of Yorkshire pierpoints with local stone ashlar dressings. The whole of the floors are fireproof, being formed of steel girders, filled in with concrete and covered with two skins of boards. In the sick wards the top skin is of polished Austrian oak, the remainder being of Baltic redwood. The corridors on the ground floor are granite finished, except a small portion at the entrance, which is laid in mosaic. The total accommodation is for 185 beds. There are four wards, each capable of holding thirty-four beds, and four isolation wards for pulmonary cases (these are so arranged that they can be heated to a high temperature if required), as well as eight more isolation wards for other cases, together with lying-in wards and bedrooms for the official staff. The heating is on the hot-water low-pressure system, by steam passing through calorifiers. In addition to the above there are open fire-ranges in each room. In each of the large wards there are two of Shorland's double-fronted stoves. There are baths, lavatories, and water-closets on every floor, in both the sick-ward and the administrative block, with hot and cold water, and fire appliances on the landings on each floor, which are fitted up with valves and hoses, and iron escape-stairs to both pavilions and the central block. The drainage is fitted up with modern appliances, with disconnecting traps and automatic flushing chambers. The cost of the building will be 30,000*l.*, exclusive of furnishing and land, whilst the total estimated cost for land, buildings, and furnishing is 35,000*l.* The various contractors' works have been executed by the following:—Masons and bricklayers' work, Messrs. A. & R. Parker; joiners' work, Messrs. R. Dean & Sons; concrete work, the Phoenix Fire Proof Company, Manchester; slaters' work, Mr. W. Stanworth, Burnley; hot-water, Messrs. James Bleazard & Sons, Padstow; plumbing and gas-fitting, Mr. John Brooks, Burnley; plastering, Messrs. Robert Rawlinson & Son, Burnley; painting, Messrs. J. & J. Hey, Colne; water-closets, baths, and sinks, Mr. G. Jennings, London; lavatories, Messrs. Shanks & Co., Glasgow; mantelpieces, Messrs. Doulton & Co., London; channel-bends and disconnecting traps, Messrs. Broude & Co., London; automatic flushing chambers and valves, Mr. Robert Fields, London; steam-pipes, Mr. W. Cowell, Burnley; cooking appliances, Mr. T. Bradford, Manchester; ventilators, Mr. E. Hatton, Manchester; and Messrs. Boyle's, London; ornamental ironwork, Messrs. G. Smith & Co., Glasgow. Mr. Samuel Keighley, of Burnley, was the architect.

SANITARY AND ENGINEERING NEWS.

STREET IMPROVEMENTS, COWPEN.—Col. A. G. Durnford, R.E., held an inquiry on Tuesday, at the offices of the Cowpen Urban District Council, Blyth, Northumberland, relative to an application from that authority for sanction to borrow the sum of 3,383*l.* for works of private street improvement, the provision of public offices, and a town's refuse tip. Mr. R. Grieves, Surveyor to the Council, explained the plans, and accompanied the inspector on a visit to the sites of the proposed works. There was no opposition.

BRIXTON CABLE TRAMWAY.—The new extension of the Brixton cable tramway was on Saturday last inspected by Major Marindin on behalf of the Board of Trade. It is now nearly three years since the cable line from Kennington through Brixton to Streatham Hill was opened. From the first it was intended that its two and three-quarter miles of

length should be prolonged southward for another mile and a half; but owing to the narrowness of the street only a single-line extension was contemplated. Arrangements were subsequently made for widening the road for three-quarters of a mile, and for this distance the tramway has now been made as a double line with an idea of extending it further in the future. The designing of the extension, as well as the supervision of the carrying of it out, were entrusted to Mr. James More, jun., engineer, to the contractors, Messrs. Dick, Kerr & Co., Limited.

BRIDGE ON THE GREAT EASTERN RAILWAY.

A work of considerable interest as illustrating what can now be done in the way of rapid bridge construction was carried out, says the *Times*, on the Great Eastern Railway at Ely on Sunday. The Cutter bridge which passed over the river Ouse at Ely was an old timber and cast-iron girder structure which was put up in 1815, but was not considered equal to the heavier rolling-stock of the present day. It had, therefore, been decided to substitute for it a bridge of cast-iron girders, and having, too, a single span across the river, on brick abutments, in place of the three spans and wooden piles of the old bridge. The problem then engineers and contractors set themselves to solve was how to put the new bridge in place of the other with the least possible interference with any of the ordinary trains, whether passenger or goods, the point in question being one of the busiest on the company's system. On Saturday the new bridge, complete in every respect, including the lines of the permanent way thereon, was to be seen standing alongside the main line in readiness for the work of Sunday. The ends of the girders were supported on small trolleys, and each of these worked on a rail placed on longitudinal timber on the top of the temporary staging, so as to allow of the new structure being eventually drawn into position. At ten minutes past one on Sunday morning operations began. In ten minutes the first rail on the top line had been removed, and in another ten minutes the first girder was being carried off by two locomotive steam cranes working on the down line. The scene was illuminated by powerful Wells' light, and girder after girder was carried off, steadily increasing the gap. The wooden piles which had supported the girders were sawn through above water-level, and the "crowns" carried off by the cranes, the lower portions being left to be drawn on a future occasion. At last the up line and the greater portion of each of the particular piles on which it had rested had been cleared right away, leaving only the down line and its supports standing. Then came the most interesting feature of the morning's work—the "traversing" or drawing sideways of the new bridge so that it would occupy (until the whole of the old bridge had been removed) the place where the up line had formerly stood. This traversing was done by means of two ropes worked by winches, and although the massive structure weighed, including rails and timber, something like 120 tons, it was drawn into its half-way position—a distance of 15 ft.—within a minute or two over half an hour. By this time it was nearly six o'clock in the morning, and the actual time taken by the operations referred to was only about three and a half hours. Work was resumed at noon, and the workers, about forty in number, proceeded to clear away the down line. The new bridge was then brought into position, for the remainder of the distance, in half an hour; the connections between the rails and with the abutments were completed, and at eight o'clock in the evening the express from Norwich to London passed safely over the new bridge. The substitution of the new bridge for the old one had taken about eleven hours' actual working, and had involved scarcely four hours' interruption of traffic. The work was carried out under the supervision of Mr. Wilson, Engineer, and Mr. Morgan, assistant engineer, of the Great Eastern Railway Company, while Mr. Anderson, the managing director of Messrs. Fildes, Wrightson & Co., and Mr. Young, London manager, represented that firm, who were the contractors.

FOREIGN AND COLONIAL.

FRANCE.—The sculpture group of Washington and Lafayette, by M. Bartholdi, presented to the City of Paris by M. Pulitzer of the New York *World*, is to be inaugurated to-morrow (Sunday) on the Place des Etats-Unis.—By a decree of the President the post of Directeur des Bâtiments Civils et des Palais Nationaux has been suppressed, and the present holder of the office, M. Jules Comte, has been placed on the retired list.—M. Lachenal, the ceramic artist, has opened at the Georges Petit Gallery the sixth exhibition of his works, many of which have been executed in collaboration with M. Rodin and M. de St. Marcenau.—The City Council of Paris has under consideration a scheme for bringing water to Paris from Lake Lemano. It is proposed by the Government to demolish the Hôtel de l'Imprimerie, a portion of which is in a ruinous state. The operation will cost about a million francs.—A large municipal theatre is being built at Saint Ouen, opposite the Hôtel de Ville.—In the foundations of a house at Anney a cavity has been found covered with a large stone and filled with fragments of statues, probably portions of the ancient convent of St.

Sépulchre which once occupied the site. Various heads have been collected which are well preserved, and a figure of Christ, larger than life, has been nearly put together complete.—The railway station at Montebellard is to be demolished, to make way for a new and much larger one with a fine building in front of it.—A vase presented by the City of Paris has been placed in the Salle des Cariatides of the Hôtel de Ville. The total height, including the pedestal, is three metres; the vase is in green jasper and is decorated with the arms of Russia and of the City of Paris blended. The two bronze handles are surmounted by heads symbolising Russia and the French Republic. The pedestal, of red jasper, is decorated with the arms of Cronstadt and of Toulon.—The jury at the competition opened for the rebuilding of the Palace of Pervagues at St. Quentin has awarded the first premium to M. Malgras, architect, of Châtea-Thierry; the second to M. Bourbier, of Laon; the third to M. J. Chénier, of St. Quentin; and the fourth to M. Fortier, of Cambrai.—The death is announced of M. Constantin, painter, and a pupil of Couture, who was a constant exhibitor at the Salon.—The death is also announced, at Havre, of M. Theodore Huchon, architect, aged seventy-three. M. Huchon was a member of the Société Centrale, and architect of the Hotel of Queen Christina of Spain, in the Avenue des Champs Elysées, at present in possession of the Duchesse d'Uzès.

GERMANY.—The central council of the amalgamated societies for the development of the inland waterways, have held a business meeting at the Berlin Houses of Parliament, in which various extensive schemes were discussed. One of the most important being the proposed inland harbour at Breslau which is to cost about 160,000*l.*, and which will be invaluable for the East Prussian trade. The frontage of the embankment will allow for the unloading of sixty boats at a time.—The Rhine-Elbe canal scheme is making rapid progress. The cost of this canal will be about seven million marks, of which 62 per cent. is to be paid from the national exchequer and the remainder by the provinces interested, in the form of a loan.—The Berlin University is to have a new Polytechnic Institution, for the surgical division. The old Polytechnic Institute trained twenty-thousand patients annually.—The subjects for the Schinkel Competition of 1896 have now been published; for architects the subject will be "A County Council Building," and for engineers, "A Metropolitan Railway."—The new Bismarck monument at Rudelsburg, shows the figure of the ex-Chancellor as a young student of eighteen, the portrait being taken from a drawing by Kessel, dated 1832. On the pediment there is a bas-relief showing Bismarck's head at the age of seventy-five; Mr. P. Retzschner is the sculptor.—The alteration and renovation of the exhibition building at the Lehrter station has been commenced, under the superintendence of Professor Ende.—The river harbour on the Spree, in the "Urban" suburb of Berlin, was opened on the 27th inst.—The "Salon," which has been closed at Berlin, has made a profit of 5,000*l.* on the entrance fees and commissions for sale of pictures. About half of this generally goes to the artists' benevolent fund.

MISCELLANEOUS.

THE LATE MR. E. P. LOFTUS BROCK, F.R.S.—We understand that the professional practice of this well-known church-architect and antiquary is being taken over, in accordance with his own particular desire, by Mr. Geo. Patrick, A.R.I.B.A., his old friend and successor in the Hon. Secretaryship of the British Archaeological Association.

PARTNERSHIP.—Mr. Graeme-Watt, architect, of Belfast, has taken into partnership Mr. F. H. Tulloch, formerly of London, and whose name is well-known to our readers. They will practise conjointly under the style of "Graeme-Watt & Tulloch."

OPAQUE BLINDS, &C., PUTNEY SCHOOL OF ART.—This school has recently been fitted with Messrs. Guyan's special opaque blinds both in lecture-hall and class-rooms, as well as an elaborate system of curtains in the lecture-room; with the double object of changing the direction of the light at pleasure, and of providing that when a lesson cannot be finished under daylight conditions, the room can be darkened and the lesson begun and finished by artificial light.

REEREDS, HOME OF THE COMMUNITY OF THE EPIPHANY, TRURO.—The sisters at the Home of the Community of the Epiphany at Truro have received some additions to their chapel. A new reered, in carved oak, has been erected. It is in a late Gothic character. In the large central space, under a canopy of tracery work, is a full-length figure of our Lord. A new shrine has also been added. It is of carved oak, the cross itself being ebony, and the figure of the crucified Christ hung upon it of pear tree. The work has been carried out by Messrs. Harry Hems & Sons, of Exeter.

PLUMBERS' WORK AND SANITARY ENGINEERING.—The ninth lecture of the course of sanitary lectures was given on the 23rd inst. at the Plymouth Technical School by Mr. Thomas N.

Andrew, M.I.E.E., on "Plumbers' Work and Sanitary Engineering." The subjects treated on were traps, joints, sinks, lavatories, and water-closets. The lecturer said that men sending out such advertisements as builder, plumber, painter, glazier, carpenter, range and stove maker, hot-water engineer, writing, graining, marbling, water-closets fixed on the newest principles, &c., should be regarded with suspicion and their signs treated as danger-boards. The lecturer, in viewing houses fit for occupation, stated that no house was fit for human occupation if it contained a bad water-closet, a non-cleansing sink, a badly-ventilated soil- or waste-pipe, a sewer ventilating into a house-drain, a drain ventilating into the house through a surface-trap, bell-trap, or any other kind of defective trap or piping. In discussing traps, various kinds of traps were shown, and their merits and demerits pointed out, and the lecturer said that the only traps fit for use in or near our houses should be made of material smooth, non-corrosive, free from angles and corners, and in places where dirt could accumulate and generate noxious gases. Every trap should have a free waterway through it so that the discharge might pass through without breaking its form, and with a water seal of from 1½ in. to 2 in. The traps used on fittings should be of the minimum size required to do the work, and the force as the sewer charge may fall with a vertical velocity on the standing water in the trap, and thus cleanse it thoroughly at each flush.

PUBLIC PARK, DORCHESTER. The land on the Cornwall Estate, Dorchester, is being laid out for the purpose of a public park and gardens. The work has been entrusted to Messrs. G. J. Kew, of Kew. The park will be enclosed with a plain wrought-iron unclimbable fence with spear heads, and the order for this work has been entrusted to Messrs. Lott & Walne, of the Dorchester Foundry. A large number of local men have already been employed in laying out the land, under the superintendence of the Borough Surveyor, Mr. J. H. Hunt.

SANITARY BUILDING CONSTRUCTION.—The eighth lecture of the sanitary science series was delivered by Mr. J. S. Warren at Plymouth Technical School on the 20th inst., the subject being "Sanitary Building Construction." The lecturer, in dealing with foundations, showed the necessity for the exclusion of dampness from the site, and explained the circumstances under which a pervious soil may become water-logged, and how by means of drainage a dry foundation may be secured. The impurities of ground air were touched upon. Diagrams showing means of preventing absorption of dampness from the surface soil by brick or stone, dry areas, damp-proof courses were exhibited, and it was claimed that even in made ground, by first draining and by laying upon the soil between the walls the 6-in. depth of concrete demanded by the London Building Act, together with the construction of ventilated and damp-proofed areas a basement—so nearly as possible—is produced, and all ground air excluded. Hollow walls and walls with vertical damp courses were shown as means of equalising temperature, and of rendering the house dry.

ART AND INDUSTRIAL EXHIBITION AT WHITEHAVEN.—Under the auspices of the Whitehaven Conservative Association, an Art and Industrial Exhibition is being held at the Granary-yard, Whitehaven. The fittings have been carried out by Messrs. Womersley, of Leeds. The electric-light has also been utilised. There is a large display of art-treasures, and the exhibition is to remain open for a month.

A BURNS STATUE FOR IRVINE, Ayrshire.—A statue of Burns is to be erected at Irvine. The commission for the statue was entrusted to Mr. Pittendrigh Macgillivray, A.R.S.A., who has just finished the figure in clay. Burns is represented standing firmly on the left foot. The right foot is drawn up, and rests on a higher plane. The statue is to be cast in bronze. On the pedestal there are to be bronze panels with scenes from the poet's works.

WATER SUPPLY IN SEVERE FROST.—Some further local bodies in South London have intimated to the Lambeth Water Company their readiness, in the event of a severe frost, to assist the directors in their efforts to deliver water at the houses of the inhabitants by letting the company have the use of the waterworks belonging to the respective boards. To all the local bodies have been applied to by the company the request for assistance in the event of a great frost has appeared to be a reasonable one, which, in the interest of the ratepayers, should be acceded to. In addition to the local bodies already mentioned as willing to assist the West London Waterworks, Mr. J. H. Little, architect, Manchester, son of Mr. H. J. Little, architect, of that city, to fill the newly-created permanent appointment of architect to the Committee. Originally there were between eighty and ninety applications from

practitioners of standing in all parts of England, and in the final three were Mr. Denison, of Wakefield, Chief Assistant in the offices of the County Surveyor for the West Riding, and Mr. E. H. Dawson, A.R.I.B.A., Assoc. San. Inst. of Lancaster. The salary of the office is fixed at £600. per annum, with staff and offices found, but a condition of appointment is that there will be no retiring allowance or pension. Mr. Little will take up his duties on January 1, 1896.

THE DESIGNING OF PUBLIC BUILDINGS IN AMERICA.—"A large number of defects are said to have been discovered in the cast-iron columns in the new City Hall, at St. Louis, in the shape of blow-holes of alarming size, which, as it appears, were caused with putty and cement when the columns would have been better still to have detected them before the columns were put into the building; or, best of all, to have contracted for the cast-iron work with some one who would never have furnished such fraudulent and dangerous material. It is curious that, in this country, the most foolish planning, miserable design, ridiculous construction, and wretched material and workmanship are usually found in public buildings. Even where the design and plan are good, the construction is very apt to be confided to some one with political influence, or to some member or friend of the little coterie which, in all our great cities, usually carries on the government; and the favoured individual, who is likely to receive the contract because of the need of the money, does his best to make all the profit that he can out of it. It will be remembered that, a few years ago, an important public building fell, by the collapse of the iron columns; and it was found, on inquiry, that the contract for them had been given to a friend of the ruling group, who carried on a blacksmith's shop somewhere in the country; and that this individual, not being possessed of means for casting a whole column at once, had set up his mould, and poured in the melted iron by small doses, until the mould was full. As each ladle-full of iron cooled before the next was melted, the columns thus consisted of irregular rings, kept together in the most insecure manner; and under the influence of a strain, they soon parted company altogether. Whether the St. Louis defects were due to the selection, by favoritism, of an incompetent contractor for the ironwork, we cannot, of course, say; but it will do no harm to have the matter fully investigated."—*American Architect.*

THE PLANET JUPITER.—The publishers of *Knowledge* announce that the first coloured astronomical plate ever issued in the magazine will appear in the January number. This will take the form of a coloured drawing of Jupiter, which has been executed by Mr. N. E. Green, and reproduced by a special process.

THE DANGERS OF HOUSE DEMOLITION.—Dr. G. Danford Thomas held an inquest on the 15th inst. at St. Pancras coroners' court, on the body of Arthur Ellis, aged 45, a house-demolisher, who was killed on the previous Wednesday afternoon by the fall of the party-wall of a house in Leighton-road, Kenish Town, which was being demolished for the Midland Railway Kenish Town Station extension. The house had, it seems, been bought for the sake of its materials by James Ades, and had been demolished down to the first-floor, a party-wall 25 ft. high, remaining. Ades and deceased, both experienced "housebreakers," were working on the job, when suddenly and quite unexpectedly the wall fell in. Ades escaped with slight injury, but the deceased was buried beneath a mass of debris. Mr. Albert N. Hawtrej, Assistant Surveyor to the St. Pancras Vestry, was, with his men, engaged in the execution of some sewer-work close by, and he at once set his workmen to clear away the debris. An hour elapsed, however, before Ellis was reached. He was quite dead.—Mr. Hawtrej said that the house was an old one, and the best bricks were not as a rule put into party walls. His belief was that this party wall had been shaken and loosened by the vibrations caused by passing trains on the Midland Railway, hard by, hence the collapse.—Answering the coroner, the witness added that there were no regulations whatever with regard to the demolition or the mode of demolition of buildings, with a view to securing the safety of the workmen employed, and that of the public.—The coroner said he had often noticed "housebreakers," as they were called, standing on the top of high walls and demolishing them with their picks, and he wondered that accidents were not more frequent. Surely there should be some kind of official supervision over this work.—Mr. Hawtrej said that was a matter for the consideration of the London County Council.—The jury in the result returned a verdict of "Accidental death."

INFRINGEMENT OF THE BARRY BY-LAWS.—At Barry Police-court recently, Henry Tozer, carried, at the instance of the Barry Urban District Council, with an infringement of by-laws by allowing two houses at Cadoux to be inhabited without certificate of completion from the Surveyor, was fined

40s. and costs, with a continuing penalty of 40s. per day unless the offence was remedied forthwith.—James Sydenham, a builder, for erecting a building in Jewel-street, Barry Docks, without presenting plans and giving the necessary notice, was fined 10s. and costs, with a continuing penalty of 40s. per day unless the offence was remedied forthwith.

FONT, CHURCH FOR THE DEAF AND DUMB, OXFORD-STREET.—At the Church for the Deaf and Dumb in Oxford-street a font has been recently dedicated to the memory of Mr. H. G. G. Ayshford. The font was subscribed for by members of the Society and other friends, and was designed by Sir Arthur Blomfield.

CLOCK AND CHIMES, ST. MICHAEL'S CHURCH, COVENTRY.—For about six weeks workmen have been engaged replacing the clock and chiming apparatus in St. Michael's tower after they had been laid aside ten years. The contract was given to Messrs. Potts, of Leeds.

SALVATION ARMY SHELTERS.—At Southwark Police-court on Thursday last week, before Mr. Slade, the hearing was resumed, for the sixth time, of the case of Dr. Waldo, Medical Officer of Health of the parish of St. George the Martyr, Southwark, against Thomas J. Robinson, a "captain" of the Salvation Army, for overcrowding the Blackfriars-road shelter on July 8, and other dates, and thereby causing a nuisance, injurious and dangerous to health. The prosecution contended that the superficial and cubic capacity of the shelter was only sufficient to accommodate 400 persons; its defence was that there was sufficient accommodation for 800 persons; and it was shown by evidence that on two or three nights the actual number of inmates rose as high as 900 and 1,000 persons. It was argued on behalf of the defendant that these admitted cases of overcrowding were exceptional, and that the limit of 800 was not usually exceeded. The prosecution did not press for penalties, but asked for an order to prohibit a recurrence of the nuisance.—Mr. Dunford, architect, of Queen Victoria-street, stated that this shelter was sufficient to accommodate 900 persons without injury to their health. Doctors were very strong on floor-space in hospitals, but it was not so important as frequent ventilation in a shelter.—Dr. W. A. Clarke, late of the Kensington Infirmary, said he was at the opening of the Blackfriars shelter, and had since visited it several times. He saw nothing there that was injurious to health, and thought the building would fairly accommodate more than 800 persons.—Cross examined: A floor-space of 12½ ft. and a cubic space of 190 ft. was sufficient in that place, but would not be sufficient everywhere. If the London County Council fixed a limit of 36 square feet and 300 cubic feet in common lodging-houses no doubt there was good reason for it, but in this shelter they could do with less, because the great attention which was paid to cleanliness and ventilation. He thought 1,000 people might be there without danger to their health.—Rebuttal evidence for the prosecution was then given by Drs. Symons, Loane, Jackson, Herron, and Bryett.—Mr. Slade, in giving judgment, said: On the question of overcrowding we have had before us several medical and scientific gentlemen of great repute, on both sides; but it appears to me that they differ so widely in their views as to the air and floor-space required for the healthy occupation of this shelter, that the wisest plan would be not to accept the evidence of either side in its entirety. In my opinion, when we consider the class of persons who occupy this shelter—we have heard that anybody is admitted there who can pay the rate of 1d., and no questions are asked as to his character or his cleanliness—we must be very careful that this place does not become, as some of the medical officers have said, a centre of infection, and, as it were, a nuisance to the whole neighbourhood. Considering that, in my opinion, the lowest of these numbers, 743 would overcrowd the premises so as to be injurious to health, which is now asserted for the purposes of this summons, it would be sufficient for me to leave the matter there, and to make the order which is prayed for; but as this case has been carried to a great length, and is of very great importance, I think it would be only fair to the defendants, and would save time and expense, if I said that I personally should not be prepared to convict the shelter of overcrowding if the number of 550 were not exceeded. There will be an order to prohibit the recurrence of the nuisance with simply 45s. costs.

DECORATION BY ST. ROBERT'S CATHOLIC CHURCH, MORPETH.—The Roman Catholic Church of Morpeth has just been reopened. Messrs. Atkinson Brothers, artists in stained-glass and church decorators, Newcastle, have designed and executed the decorative work in its interior.

ARTS AND CRAFTS EXHIBITION AT DUBLIN.—This exhibition, promoted by the Arts and Crafts Society of Ireland, was opened on the 26th inst. in the Royal University buildings, Earl's Court-terrace, Dublin, by the Lord-lieutenant of Ireland. The society, which is now in its first year of existence, was established with the objects of improving the craftsmen of the country, and attempting to raise the artistic level of their work. The exhibition consists of three sections, the first of which is devoted to contemporary Irish work in original design and handicraft; the second, named the "retrospective

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premia.	Designs to be delivered.
*Laying-out Endcliffe Hall Estate	Endcliffe Estates Co. Ltd.	100, 50, and 25 Guineas	Dec. 31
*Technical School	Lincoln Borough (T. Lawford)	20, and 10,	Jan. 31
*New Detach of Infirmary	Shardlow Union		

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Weaving Shed and Warehouse, Holden Bridge, Yorks.	Yatradysford & Co. Ltd.	W. H. Cockcroft	Dec. 3
Schools, Basing, Glouc.	Board	J. D. Denny	do.
*Contracting of Settling Tanks, &c.	Sutton - In - Ashfield, U.D.C.	Official	do.
*Kerling, Tar Paving, &c.	Leeds School Board	R. H. H. Hand	Dec. 4
Schools, Aynfield, near Romsey, Hants.	Truro U.D.C.	Official	do.
Roads and Erection, Rye, Kent.	Uckfield U.D.C.	do.	Dec. 5
Street Works, Alexandria, &c.	Strood (Kent) Union	do.	do.
Paig Works, &c.	Chagwy Corporation	do.	do.
Roads, King, Chelmsford, Essex.	Hove U.D.C.	Burgess Hill (Sussex) U.D.C.	do.
Private Road Works, Silverdale-road	Northam, Devon U.D.C.	C. P. Saunders	Dec. 6
Widening Northam ridge, &c.	Church, Angli, &c.	R. J. Tye	do.
Shops, Abingdon, Oxford.	Sharncliffe, Leeds, &c.	M. J. Francis	do.
Sewering, &c.	Valley Street, Stanningley	R. W. Goss	Dec. 6
Erection of Office, Building, &c.	Medford Railway	Bourne & Son	Dec. 7
Farm Buildings, Cornworthy, Devon.	Westerley Corp.	Rugby Union	do.
Wards at Work, &c.	Leicester Corp.	G. N. Railway Co.	do.
Cast Iron Pipes, &c.	Supply of New and Purchase of Old Pipes	East Preston Sussex Union	do.
*Renewing Leaded Lights	American Union	H. Howard	Dec. 9
*W. & Paving	Works, &c.	W. W. Davies	Dec. 10
*Tidal Storage Sewer, Aberystwyth, Wales.	Northleach Union	Prothero & Phillott	Dec. 11
*Construction of New Urinals	Woolwich Union	Official	do.
*Supply of Steam Washing Machine			

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Three Shops and Houses, Ready Carr-road, Mar-John, Yorks.	Charlton Union	J. Kirk & Sons	Dec. 12
*Iron Staircases	do.	do.	do.
*Ferra Cotta	do.	do.	do.
*Stairs and Materials	Nottingham Corp.	A. Brown	do.
*Construction of Underground Urinal	Borough of Brighton	F. J. C. May	Dec. 11
Drainage (three contracts)	Perth and Winton U.D.C.	G. S. Horton	do.
House, Stalling, & Patri, &c.	Reeds Corporation	A. C. Turley	do.
*Erection of Pumping Station	Manchester Corporation	G. & F. Hodson	do.
School, Bolton Brow	Sewerly Bridge School Board	Horsfall & Son	Dec. 18
Chapel and School, Manchester road, Barry, Leics.	Stonbridge Main Drainage Board	H. Whitaker	do.
Cast-iron Pipes and Branches	do.	M. Fidan	Dec. 10
Waterworks, Hazon, Northumberland	do.	do.	do.
Lodging House, Darwen, Lancs.	Woods & Thackeray	do.	do.
*Gravel Kery Yorks.	Paddington Vestry	Official	do.
*Broken Granite	do.	do.	do.
Schools, Crowland, near Eddisbury, &c.	Gulash School Board	J. Berry	Dec. 17
*Bridges of Dwellings, Richmond Green	Leeds City Council	do.	do.
*Making Patent Tiles for Fireproof Floors	A. D. Dawney, Esq.	do.	Dec. 19
*Iron and Squeague Pipe Sewers	Urban Health	do.	do.
County Buildings	Durham C.C.	Barnes & Coates	Jan. 1896
Cottage Houses, Schools, &c. Styl, Cheshire	Charlton Union	J. E. Bradstreet	Jan. 23
*Cottages, Homes, Workshops, Hospitals, &c.	do.	do.	do.
Mortuary, &c. at Workhouse	Droxford (Hants) Union	Official	No date
Kerling	Droxford Corporation	E. Go-frey	do.
Fifteen Cottages, Morris-street, Peterborough	F. Smith	J. G. Stallebrass	do.
Offices, Stables, &c. Calder Vale, Burnley	Greenhalgh's Dyeing, &c. Works	C. Riley	do.
Additions to School, Old Farley	Leeds School Board	W. & Bradshaw	do.
Two Houses, Major-street, Thorne, Yorks.	do.	H. Long	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works	Boro of Darlington	27 3s per week	Dec. 7
*Instructor in Woodwork	School Bd. for London	310s. each	Dec. 12

Those marked with an asterisk (*) are advertised in this Number. Competitions, pp. iv, & xviii. Contracts, pp. iv, vi, & viii. Public Appointments, pp. xvi, & xviii.

section," contains a collection of Irish antiquities; and the third is a loan collection of contemporary English work, sent by the Arts and Crafts Exhibition Society, London.

LEGAL.

CASES UNDER THE NEW BUILDING ACT.

At the Lambeth Police Court, on the 26th inst., John Anley, a builder, of Dalston-lane, was summoned by Mr. Ellis Marsland, District Surveyor, for failing to comply with a notice served upon him under the terms of the new Building Act of last year.

Mr. Williams appeared in support of the summons, and Mr. Washington defended.

The defendant has been building a beer-house, known as the "Boyton Arms," Boyton-road, Camberwell, and the case for the complainant was that the defendant had committed an irregularity in not making the passages, staircase, and means of approach to that portion of the premises used as a dwelling-house of fire-resisting materials. It appeared that the staircase had been made of common wood.

For the defence it was said that the public portion of the premises was separated from that set apart for domestic purposes by a fire-resisting wall, fitted with a fire-proof door, and Mr. Washington contended that as the staircase was contained within the dwelling-house, the Act did not require that it should be constructed of fire-proof materials. After considerable argument, Mr. Hopkins dismissed the summons, subject to the defendant undertaking to put a fire-proof door at the bottom of the cellars.

Messrs. Perry & Co. were summoned under the new Building Act, at the West London Police-court recently, for having laid out a new street at Blythe-road, Hammersmith, without the sanction of the London County Council.

For the defendants it was contended that the place in question was not a public street in any sense of the term. The summons was dismissed, with seven guineas costs.

LONDON BUILDING ACT, 1894:
WOODEN STRUCTURES, SECTION 84.

At Southwark Police Court, on the 26th inst., Mr. Fenwick gave his decision upon an adjourned summons taken out by Mr. Bernard Dicksee, Dis-

trict Surveyor for East Newton, &c., against Mr. W. Maham, of 140, Rockingham-street, S.E., for an order to enforce a notice of irregularity served by the District Surveyor in respect of a wooden structure erected between Nos. 56 and 57, Great Dover-street. The irregularity complained of by the District Surveyor, who conducted his own case, was the erection, without having first obtained for that purpose a licence from the Council, of a wooden hoarding, to be used as a signboard, measuring about 20 ft. by about 12 ft. wide, fixed over the entrance gateway to a yard between two houses, and about 3 in. back from the face of the front walls of the houses, the lower edge being some 14 ft. or 15 ft. above the roadway. The hoarding was constructed of 2-in. by 2-in. quartering, braced, and boarded over the whole surface with 1-in. boarding covered with canvas.

It was contended by the District Surveyor that this was a structure for which a licence of the Council was required by Section 84 (1): hoardings enclosing vacant lands, not more than 12 ft. high, and hoardings licensed by the Local Authority under 57 Geo. III. c. 29 sec. 75, were specially exempted by the section; the expression "structure," therefore, must be taken to include all hoardings not so exempted.

Mr. Washington, who appeared for the defendant, argued that the District Surveyor had no jurisdiction, and that the procedure was wrong, also that this was not a "structure" intended by the section, as a structure must enclose some space. He quoted several cases, including *Wendon v. L.C.C.*, to show this; as far as he knew there was no case where a plain flat erection such as this had been held to be a structure.

Mr. Dicksee quoted *Lavy and Upjohn v. L.C.C.*, recently decided in the Court of Appeal, where a screen-wall was held to be a structure in advance of the general line of frontage.

Mr. Fenwick held that the District Surveyor had jurisdiction, and that the hoarding was a structure for which the licence of the London County Council was necessary: he therefore decided to adjourn the summons for six weeks to enable the defendant to apply for a licence.

MEETINGS.

MONDAY, DECEMBER 2.

Royal Institute of British Architects.—Third General Meeting (Business) for (1) the Election of Candidates for Membership; (2) Mr. G. A. T. Middleton, "To draw attention to certain Anomalies existing in the Papers set at the Intermediate and Final Examinations as now conducted." 8 p.m.

Society of Engineers.—Mr. W. T. Sugg on "Ventilation and Warming." 7.30 p.m.
Society of Arts (Lecture).—Mr. W. Worby Beaumont, on "Mechanical Road Carriages." 8 p.m.

TUESDAY, DECEMBER 3.

Institution of Civil Engineers.—Papers to be read with a view to discussion:—(1) "The Influence of Carbon on Iron," by Mr. John Oliver Arnold; (2) "The Dilatation, Annealing, and Welding of Iron and Steel," by Mr. Thomas Wrightson. 8 p.m.

British Architectural Association.—Rev. J. Cave Browne, M.A., on "Purbeck and its Marble." 8 p.m.
Society of Arts.—Mrs. Anna Lea-Merritt and Professor W. Chandler Roberts Austen on "Mural Painting, with the aid of Metallic Oxides and Soluble Silicates." 8 p.m.

Builders' Foremen and Clerks of Works Institution.—Ordinary Meeting of the Members. 8 p.m.

Architectural Association (Discussion Section).—Mr. W. Harold Oakley on "Architectural Drawing." 7 p.m.

WEDNESDAY, DECEMBER 4.

Royal Archaeological Institute.—(1) Mr. F. C. J. Spurrell on "Some Flint Implements Recently Excavated by Professor Petrie." (2) Mr. C. C. Carnana on "Some Megalithic Discoveries and Explorations in the Island of Malta in 1892-93." 4 p.m.

British Architectural Association.—Rev. J. Cave Browne, M.A., on "Purbeck and its Marble." 8 p.m.

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Architectural Association (Discussion Section).—Mr. W. Harold Oakley on "Architectural Drawing." 7 p.m.

THURSDAY, DECEMBER 5.

Society of Antiquaries.—8.30 p.m.

FRIDAY, DECEMBER 6.

Architectural Association.—Professor Herkomer, A.R.A., on "Scenic Art." 7.30 p.m.

Institution of Junior Engineers.—Paper on "Considerations with Respect to Water, Gas, and Electric Mains, &c., in Connection with the Formation of Urban Roads and Footways," by Mr. J. Julian. 8 p.m.

SATURDAY, DECEMBER 7.

Sanitary Inspectors' Association (Carpenters' Hall, Throgmorton-avenue, E.C.).—Mr. J. M. Jones on "The Public Health Acts, with Suggestions for their Improvement so as to Secure their More Effective Operation and to Simplify Procedure." 6 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

22,633.—PAVING STONES: J. Lebau. A paving-stone or block consisting of a box composed of metal, baked clay, or other suitable material, and filled with asphalt.

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 Company, Ltd. 7,150 0 0
 W. Wilson & Co. 7,104 0 0
 J. Whitehouse 6,850 0 0
 D. Adams & Co. 6,820 0 0
 V. Coates & Co., Ltd. 6,900 0 0
 N. Taylor & Sons .. 6,447 0 0

LONDON.—For reconstructing corridors, staircases, and parti-
 tions, "Three Buns," Aldgate, for Mr. J. W. Galton. Mr. C. J. C.
 Pawley, architect:—
 Green & Co. £1,758
 Spencer & Co. 1,675
 A. Hood 971

LONDON.—Accepted for fittings to saloon bar at "The Unicorn,"
 Shoreditch, for Mr. J. W. Galton. Mr. R. A. Lewcock, architect:—
 A. Hood £1,150
 [No competition.]

LONDON.—For sanitary works at Stepney Union, for the
 Guardians of the Poor. Mr. G. E. Holman, architect:—
 W. Shumway £4,450
 W. G. Holland 3,473
 Atherton & Dolman 2,351

LONDON.—For building new shops with flats over in Basil-street,
 Chelsea, for the Directors of Harrod's Stores Company, Limited.
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 Mr. W. H. Elmore, surveyor, Castlemore, Barnes, S.W.:—
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 Stephens, Bastow, & Co.,
 Ltd. 8,400
 J. Smith & Son 8,177
 Martin Wells & Co. 8,200

LONDON.—For alterations at No. 244, King's-road, Chelsea, for
 the Borough of Chelsea Permanent Building Society. Messrs.
 Wheeler & Son, surveyors 170, Fulham-road, South Kensington:—
 Wade £2,750
 Jesson 226 0 0
 Bradley 195 10 0

LONDON.—For drainage works, Ely-place. Mr. A. H. Hirstock
 architect and surveyor, Southwark:
 Buckridge Bros. £1,175 0 0
 W. & T. Cooper 453 10 0
 W. Coates 441 0 0
 Coulhill Bros. 385 0 0
 Fry Bros. 374 10 0
 W. Nicholls 371 0 0
 C. A. Simmons 369 0 0
 W. Mills 39 0 0

LONDON.—For new warehouse at rear of 221, Mare-street,
 Hackney. Mr. H. W. Dolb, architect:—
 Sargeant £627
 N. Fothergill 595
 W. Shumway 540

LONDON.—For proposed alterations, additions, and repairs at
 No. 42, King-street, Cheap-side, E.C., for Messrs. Joseph I. Byers &
 Co. Mr. J. R. Manning, architect, Milkwood Estate Office, Herne
 Hill, S.E.:—
 Bartley, Son, & Hol-
 mes £2,277 0 0
 Holliday & Green-
 wood 2,177 0 0

Maple & Co. £184
 Berry & Son £243

MONMOUTH.—For alterations and additions, &c., to the
 National Schools, Monmouth. Mr. George E. Halliday, architect,
 1A, High-street, Cardiff. Mr. J. W. Redger, surveyor, 14, High-
 street, Cardiff:—
 Jones & Co. £1,598
 Richards 1,577
 Roberts 1,523
 Wood & Son 1,590
 Forre 1,590
 Parkin 1,375
 King & Son 1,257

PENRHYNWEDDER (Wales).—For the erection of five houses
 and three shops. Mr. S. Rodney, architect, 9, Quay-street,
 Cardiff:—
 John Griffiths £2,041
 C. Jenkins & Son, Portm 1,925

WALTHAM CROSS.—For new library, &c., at Waltham Cross,
 for Lady Meux. Messrs. Marshall & Vickers, architects:—
 J. Bentley £1,471
 W. Shumway 1,385

WEALDSTONE (Harrow).—For the erection of colour, litho-
 graphing, and printing works, for Messrs. David Allen & Sons.
 Mr. F. G. Knight, architect. Quantities by Mr. F. E. Smith:—
 John Mowlem & Co. £23,888
 Hall, Bedford, & Co. 27,300
 Patman & Fotheringham 21,951
 J. Dixon 21,143
 Higgs & Hill 20,974

TO CORRESPONDENTS.

H. D. (no easy method of such analysis exists; but the proportion
 of cement may, roughly, be judged from the manner the whole sets.
 The best way is to supervise the proportions of time and cement
 used in the first place, unless you are prepared for a scientific
 investigation).—T. W. (we cannot give an opinion without knowing
 the facts).

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Part of West Door, Reims.—Drawn by Mr. G. C. Horsley	Single-Page Photo-Litho.
Buttresses, St. Étienne le Vieux, Caen.—Drawn by Mr. G. C. Horsley	Single-Page Photo-Litho.
Bedford Court Mansions.—Mr. Allan F. Vigers, Architect	Double-Page Photo-Litho.
Stables, Graythwaite Hall, Windermere.—Mr. R. Knill Freeman, F.R.I.B.A., Architect	Double-Page Photo-Litho.
Small Country Houses.—Mr. T. W. Cutler, F.R.I.B.A., Architect	Double-Page Photo-Litho.

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Architect or Dilettante?

WE seem destined never to have an end of the dispute as to what an architect is, what he is to do, and how he is to be educated; and Dr. Rowand Anderson takes up the budgets afresh against the Institute of Architects and all its works, in his Presidential address to the Edinburgh Architectural Association, the portion of which dealing with this subject is printed on another page.

The Edinburgh Association, we learn from the address, is, in comparison with other architectural societies in the kingdom, a peculiarly constituted body; membership of it is not restricted to architects, but it includes sculptors, painters, and artists in other branches of work, who are equally eligible as members with the architects. Such a Society should unquestionably contain in itself the elements for a great deal of most interesting discussion and exchange of opinions on artistic subjects, but we fail to see why it should in that case be called an "Architectural Association," which, by the President's own showing, it is not: it should rather be the "Edinburgh Association of Artists"; being in fact a Society analogous to that in London known as the "Art-workers' Guild," which it resembles also in another sense, in that the Guild is also permeated by the same dislike to the professional architect and to professional societies, though as a matter of fact one or two members of the Institute are to be found among its ranks. We had better have societies properly defined in accordance with their real constitution and objects.

Dr. Anderson repeats all the arguments that we have heard again and again for some years back against the Examinations of the Institute, and in fact against the existence of any Institute of Architects at all, and repeats so the questionable argument to the effect that none of the buildings we most admire are built by architects. As we have more than once urged, the statement itself is more than doubtful one, and is probably quite at variance with fact in regard to the great many celebrated buildings, if we had the means of getting at the actual facts. But

in any case, if Dr. Anderson's convictions on that point are so strong, why, it may surely be asked, does he not cease to profess to be an architect himself? That is the experience we have had repeatedly in regard to those who affirm so strongly, in effect, that architects are a mistake, a nuisance to art; that architecture is not a profession at all. We do not find that the more prominent architects who profess this view differ at all in their practice from other people; they keep offices, which they do not even call "studios," and write letters to their clients like other people; so that one is rather led to think that the whole matter is a question of names more than anything else.

Dr. Anderson refers to the usual Architect's Registration Bill which is said to be coming before Parliament, a bogey which is annually held up to us, but which has almost ceased to frighten any one by this time. The form which this Bill has now taken, and the results which are desired and expected from it, which were brought into new light by a circular issued a short time since to those members of the profession who it was supposed could be caught by it, appear so preposterous that a mere statement of the case ought to be sufficient to condemn it in the eyes of any sensible and educated person, and it seems probable that the four Members of Parliament who have backed the Bill have been misled as to its real object and the effect which it would actually have. But Dr. Anderson thinks it may have some support, apparently because he recognises that there is a certain desire on the part of the public that they should have some proof or conviction that when a man calls himself architect he really understands the business. If Dr. Anderson considers that such is the case, that there is beginning to be a kind of public demand for a test as to architectural ability, and that it may become impossible to evade it—and that is apparently his impression—it is really astonishing that he should not see that the system of examination for entrance to the Institute, if generally supported, is the one system before us which could gradually provide against that public demand without the mischievous consequences, and the lowering of the standard of the architectural profession, which would follow from the system, proposed by the Bill in question, of recognising and endowing with a status all

existing practising architects at one swoop. The Institute system could only produce its effect gradually, but its result in the end ought to be that whatever good effect can be produced by registering architects would be produced without the bad effect which would follow from the kind of registration bills which have been proposed year after year, and without in any way putting all architects on the same æsthetic level, or pretending to do so. Those who care about a building being carried out as a work of art would select architects in whom they had confidence just as they do now; but if they selected them from the ranks of the Institute they would, after allowing time for the Institute system to produce its practical results, know that they could at least also be sure of finding there a man who could be trusted with the practical side of building.

The more important question is, however, whether this view of the architect as an artist on the same plane with the painter and sculptor is not really a mistaken one; whether it is not claiming too much on one side and giving up too much on the other. As far as architecture is an art, it is at all events not a plastic art like sculpture and painting, nor can it be carried out by the personal hand of the artist as a picture or a statue can. To say that the architect ought to be a man who builds with his own hands, as we have heard lately, is absurd on the face of it, seeing that however much he had the capability to act, himself, as a practical builder, one man cannot execute a building as one man executes a statue, for the simple reason that the work is too big for one man's labour. Division of labour, and labourers under the direction of one head, must come, for anything larger than the smallest cottage; and then where is the position of analogy between architect and painter?

The danger is that when architects desire to take their stand as artists above everything else, and on the same ground with other artists, they will come to regard their function as simply that of giving an expressive and decorative treatment to a building, and that while dwelling on this side of the work they will "neglect the weightier matters of the law," and forget that, in the sense in which architecture is an art, it is the whole art of planning and constructing a

building for the best fitness for its purpose, practical and æsthetic, and that the practical and æsthetic are inextricably bound up together from the very beginning. A great deal of what is part of the real art of architecture has nothing to do with the art of design as understood by other artists, and is what they often neither comprehend nor sympathise with. And an architect who is mainly considering architecture from the point of view of design in a painter's sense of the word is very apt to become, in real truth, a dilettante rather than an architect. In fact we actually see the process going on. We see architects who occupy their minds a great deal with the style and artistic effect of their buildings, but who are entirely deficient in the power of planning, and who do not properly look after the drainage, ventilation, or even foundation of their buildings. We see a case mentioned in the daily papers only this week, of a monument designed by an artistic draughtsman, which is already in danger of collapsing from the imperfection of the foundation, which the architect (or "designer") evidently had not seen to properly. This is a typical instance of a good deal that is going on among the ranks of "artistic" architects. We call such a man a dilettante architect, not a real one. He is playing on the surface of the subject, and neglecting its severe practical and scientific basis, and thereby actually giving up a great deal of what makes the real dignity as well as the real interest of architecture. There is no better summary of the subject of architecture, no better architectural "bible," if we may so call it, than is comprised in Gwilt. Take the immense range of knowledge on various subjects which is outlined there as included in the province of the architect, and say if it is not a study any man might be proud to be master of (if he could), and if there is not something far more dignified, far more worthy of serious attention, in the scope of the art of architecture as there set forth, as an art based on severe geometric and practical studies, than in the mere production of picturesque buildings. The one, to our mind, is architecture, the other is dilettantism.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND

BY PROFESSOR BALDWIN BROWN.

VI.—Celtic Influence.

A PASSING notice has already been given to the square ends of Saxon churches, and to the theory that would explain these from sources outside the sphere of Roman influence. It may, however, be asked at the outset, why should we give prominence to the fact that a few apparently early Saxon churches possess this feature? They are mostly of a village type, and as the square end is undoubtedly simpler than the apse, it may well be urged that its use is due to considerations of cheapness or to want of skill in the builders, rather than to any hidden or far-reaching influence. The answer to this is that the significance of the feature in question only emerges when it is looked at in the light of subsequent facts in our architectural history. The real starting-point is the pronounced decision in favour of square as against apsidal choirs, arrived at by our post-Conquest builders. If we take twenty-four greater Norman churches that held, or now hold, cathedral rank, we find that nearly three-fourths of them were planned by their original builders to end apsidally, while so greatly did the fashion change that in their present condition (leaving out St. Paul's) there are only four of the number—Canterbury, Norwich, Gloucester, and Peterborough—that show the circular termination, nor would it be easy to name any later English Mediæval churches of similar rank, except Westminster Abbey, that were built with apsidal choirs. In

respect to what Professor Freeman called "the strange insular tradition of the flat end," our churches form a group apart from those of the rest of Europe in that their peculiarity is national and not due to the influence of any special religious rule or set of ideas. In the churches of reformed monastic communities throughout Europe we find the apse frequently abandoned in favour of the more simple and unassuming square end. The Cistercians did this most markedly, but the same result followed in many cases from the older Cluniac reform, as well as the later movement of the Preaching Orders. In England, however, the Episcopal churches served by secular canons, as well as the old Benedictine houses, were quite as ready as the offshoots of Cîteaux to surrender the Roman feature of the rounded choir.

For this noteworthy characteristic of English architecture there must exist a reason, and this cannot be the most obvious one of cheapness, for the practical abandonment of the apse took place at a time when great architectural undertakings were in the air, and wealth was poured out lavishly for new fabrics and their adornment. Carl Schnaase, who is still the master of all those who work at the history of the arts, devotes one of his philosophical pages to suggestions for an explanation, and mentions the possible influence of pre-Conquest tradition. This hypothesis of an old national prejudice in favour of the rectangular choir, which reacted against the imported fashion of the apse and ultimately triumphed, lends a significance to the form of our earliest churches that it would not otherwise have possessed. Such a tradition existed in parts at any rate of Britain, and our national history lets us see how it could have been brought to bear at an early date upon the country at large. The tradition in question originates in the Irish or Celtic square-ended stone oratory, which was the outcome of habits of building in masonry indigenous in certain Celtic lands, and at first quite independent of all Classical influence. It is true that of the existence of such a Celtic stone style we are not informed by our authorities, for Bede contrasts in matters of building the *mos Scottorum* with the *mos Romanorum*, and seems to understand by the former building in wood, by the latter construction in stone. When he uses the expression *more Scottorum non de lapide* about the original church erected by the missionaries from Iona on Lindisfarne, it is clear that Bede and his associates understood wood to be the native style of building of the Celts of Scotland and Ireland. Yet, on the other hand, there is convincing monumental evidence that the Celts both of Ireland and Scotland were well practised in stone building, and had erected churches of masonry from a very early period. In any monumental history of Ireland, the chapter that describes the gigantic works of defence of a period to all appearance pagan will be followed at once by one recording the erection, in the same technique, of oratories and monkish cells of the earliest Christian missionaries. There is no doubt as to the Christian character and the early date of a large number of Irish stone buildings, and these can be sufficiently matched by Scottish examples to show that the Scots on both sides of the Irish Sea knew perfectly well how to erect stone churches after their own native pattern. This monumental evidence is so clear, that we can only explain the expressions of Bede on the supposition that he was treating in a somewhat summary fashion a subject in which he was not specially interested. We may take the expression *mos Romanorum* to imply, not only the mere use of stone as a material, but the employment of Classical features, such as squared ashlar, the arch, and lime-mortar and plastering, while *mos Scottorum* points to the fact that, on the whole, wooden buildings were far more common among the Celts than stone.

Admitting, however, that whether ex-

ceptionally, or by a less prevalent *mos*, the Scots built in stone as well as in the less durable material, we have still to ask (1) whether there is any probability that the Celtic tradition of stone building affected the form and technique of our primitive English churches, and (2) whether, if this be the case, the fact has any bearing on the late preponderance of the square end in English churches. Those who reject the hypothesis of Celtic influence may point to the fact that when the Hiberno-Scottish missionaries settled in their abode at Lindisfarne, the first church they erected there was not of stone, but of wood. If this appears very unlike the introduction of a native Irish or Celtic stone style, we may turn for further instruction to a curious passage in Bede's prose life of Cuthbert. This saint was a Northumbrian and a Romaniser, but he had evidently imbibed from the Scots certain of their characteristic habits in the ascetic life, as well as an insane terror of the female sex. Bede tells us (chapter 30) how he constructed for himself on one of the Farne islets a place of retirement comprised within a high ring-wall, and containing an oratory and a dwelling-hut. The wall was not of cut ashlar or brick and "cementum," but of unwrought stones, some of which were of large size. Bede takes it that the ring-wall was intended to keep his eyes and thoughts from dwelling on the outer world, but the truth is that what he constructed was simply an Irish, so-called, "Cashel," a wall of fortification round the huts and oratories of an early monastic settlement. The work was of thoroughly Celtic type, useless on a wave-girt islet off the friendly Northumbrian coast, and clearly an instance of a traditional form of construction imported by the immigrant priests.

If Cuthbert thus conformed to the habits of the Celts, whom in ecclesiastical matters he opposed, it is highly probable that the Scottish missionaries themselves would carry on their native methods in the construction of the various churches which Bede tells us they erected in different places soon after their arrival (*Hist. Eccl.*, III., 3). Ceddo at Lastingham set up a characteristically Celtic establishment, consecrating the spot by a curious rite of incubation (*ibid.*, III., 23), and though the church he himself erected there seems to have been of wood, yet a stone one soon superseded it, and would be almost certainly of Celtic form. We are not told what was the fashion of that "*monasterium permodicum*," which a Scottish missionary had built at Bosham, in Sussex, before a Wilfrid had brought to the spot the light of Romanised Christianity. Of the original church at Malmesbury, erected by the "*Scottus*" Meildulf before Aldhelm's time, William of Malmesbury tells us that it was "a very small basilica," and had lasted almost to his own days. Had it not been of stone he would almost certainly have mentioned the fact. On the whole, we may safely say that there is no reason why the Celtic missionaries, who penetrated to almost every part of the land save into the Roman preserve of Kent, should not have carried with them the characteristic features of their own native stone style.

Passing from these questions of *a priori* likelihood to the Saxon buildings themselves, we may ask, What is there about them that is specially Celtic? Too much must not be made of the general plan, for if the oblong single-aisled interior with rectangular chancel is a Celtic type, it is too common to other periods, both in England and on the Continent, for its appearance in early Saxon days to be specially significant. The varying proportions of the parts that compose this type of church are, however, worth attending to. The ratio of width to length varies remarkably. In the three apparently earliest churches in the North, Escomb, Monkwearmouth, and the now-destroyed Jarrow, it is in feet about 14½ to 43½, 19 to 66, and 18 to nearly 80 respectively; while in the probably late Wittering and Corhampton, and the dated chapel at Deerhurst of about 1056

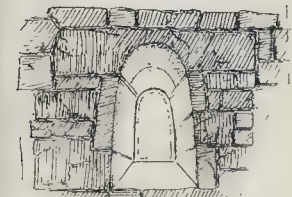


Fig. 36.—Window, north of Nave, Escomb.

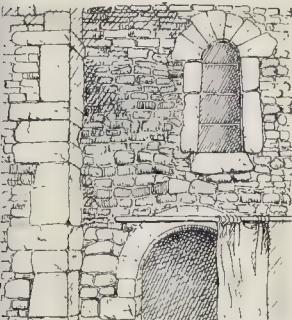


Fig. 39.—Brigstock, Northamptonshire; north face of tower, and north-west quoin of nave.

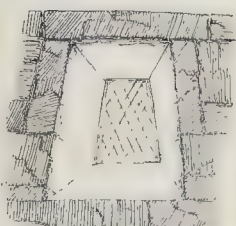


Fig. 37.—Window, south of Nave, Escomb.

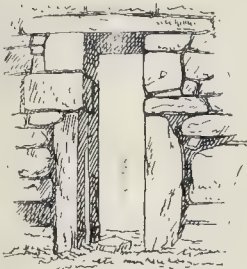


Fig. 40.—Doorway in the Church of the Canons, Aran, Ireland.

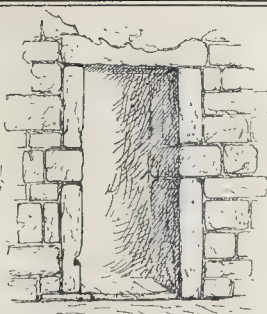


Fig. 38.—North door of Nave, Escomb.

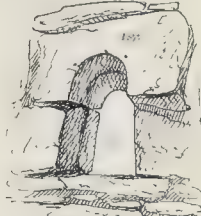


Fig. 41.—Window, Kull Enda, Aran, Ireland.

stands at 17 to 31, 18½ to 36, and 16 to 53; or, in other words, while in the first group the length is three to four times the width, in the other three it is not as much as twice. We may have here a useful criterion of relative dates, but hardly a sign of Celtic tradition, as the old Irish and Scottishatories are not particularly elongated. The chancel arches have in the above examples, so far as they have been preserved, the same relative widths, while at Bradford-on-Avon, where the nave is in its proportions intermediate between the above two groups, the chancel-arch is almost as narrow (3 ft. 4 in.) as the external doorways. Now a narrow chancel opening after the pattern of a doorway is certainly a characteristic of early Celtic churches in Scotland, if not in Ireland, and may be claimed as evidence in favour of the Celtic influence we are discussing.

Passing from plan to elevation, we note two characteristics in the Saxon churches of earliest type, the great height of the walls and the steepness of the gables. In old Farrow Church, according to Hutchinson's 'History of Durham,' the former was nearly 50 ft. on a width of 18 ft., and at Monkwearmouth the measurements are about the same, while at Bradford-on-Avon a nave only 13 ft. wide has walls of the height of 25 ft. The steepness of the gable of Monkwearmouth has already been noticed (p. 250, ante). These features, however, though apparently early, are pretty constant through the Saxon period. The chancel of Repton (p. 217, ante) is built over a columned crypt of Mediæval, not Early Christian, type, and has curiously lofty walls, while the same characteristic is noted at the probably late Wittering. The cruciform Norton, again, shows the marks of very steep gables on the four faces of its Saxon tower. In seeking an explanation of these features, we must take into account the pertinent fact that the towers, which cannot be very early, exhibit the same tendency to height and slenderness as the fabrics themselves. Is this tendency a matter of Celtic tradition?

Some help towards an answer to this question may be derived from a comparison with some early churches in north-western France, which would probably be the portion of "Gallia" most in touch with England in early Saxon times. Besides the "Basse Œuvre" and other primitive examples in

Picardy, there is a group near Tours, some of which MM. Bourassé and Chevalier ("Eglises Romanes en Touraine du VI^e au XI^e Siècle") would identify with buildings mentioned by Gregory of Tours, at the end of the sixth century. This may be somewhat rash, but we need not doubt that the style of some of them carries us back to a time corresponding to the date of our early Saxon churches. We have already seen (p. 370, ante) that the technique of their masonry is Roman, and quite different from that of our native examples, but in the matter of proportions there is this point of interest, that, while they are not distinguished by special length and narrowness, yet some of them are remarkable for a great proportionate elevation of the walls, though, on the other hand, the pitch of the gables is low. On this last point the authors just quoted remark:—"La toiture originale était toujours surbaissée comme dans les édifices Italiens," and the present writer's observation, so far as it has gone, bears out what they say. Now it is possible to find an explanation of the lofty walls which will apply to "primitive Romanesque" buildings in north-western Europe generally. The whole of this region suffered greatly from Viking inroads, and it may well have been with a view to protection that the walls of the stone churches were reared to this abnormal elevation. It was an obvious advantage to lift the window-sills and the roof as high as possible above the range of the firebrands, and as this characteristic of height is the only non-Classical feature about this group of Touraine churches, some special cause of this kind must have been in operation. It may be argued that, if this explanation is correct, the lofty Saxon churches would not be earlier than the Danish invasions of England in the ninth century. The need for a certain element of fortification about a church may, however, have been felt earlier, and it is not to be forgotten that the primitive monastic settlements of the Irish were commonly in a fortified enclosure or "cashel."

The steep slope of the gable is, on the other hand, a characteristic of the Irish oratories. Miss Stokes speaks of a "singularly steep roof" as belonging to the typical Irish church ("Early Christian Art in Ireland," II, p. 79). Is it too far-fetched to suggest an origin for this in the native

construction of stone roofs by the process of encorbelment, before the Classical vault was understood? Such roofs (as was noticed incidentally not long ago by Mr. H. H. Statham in a note to his book on "Architecture for the Public") are necessarily steep, as the successive layers of stones must be laid so as only to project slightly beyond the line of those below. The tradition of these pseudo-vaults may have been operative in this country, though Saxon churches were actually covered with roofs of wood, which are all the comparatively slight walls would have borne.

In technique and details the early Saxon churches have certain marked characteristics in common with the Irish monuments. The irregular, imperfectly squared stonework occurs in both, but we cannot, perhaps, say more about this than that the work in both cases is non-Classical. The Saxon quoining is not apparently derived from this source, though in their "megalthic" character the big stone quoins remind us a little of early Irish masonry. The resemblance in certain door and window openings is, however, too striking to be a case of coincidence, and is the point of special weight on the side of those who postulate the Celtic influence now under discussion. Figs. 36 to 38 show three openings from Escomb—two windows and the north doorway of the nave. Two have square lintels, and the third a round head cut out of two single stones, one behind the other, that on the inner face of the wall being 7 ft. long. The windows have an internal splay, and the jambs of all three openings are inclined. With the inclined jambs may be taken the feature of a slight batter in the main walls of the building as they rise, observable at Escomb and some other Saxon examples. These last features are certainly non-Roman, though they occur in other phases of Classical art, and they are just as markedly characteristic of the primitive stone architecture of Ireland. M. Perrot, in the latest volume of his "Histoire de l'Art dans l'Antiquité" ("Grèce Primitive," p. 506), gives an ingenious but somewhat far-fetched explanation of the sloping jamb, but it is sufficient to understand it as due to the wish to save material in the flat lintel, the length of which may in this way be reduced. It occurs in early Greek stone architecture, as in the doorway of the "Treasury of Atreus,"

and survives even in the time of perfection of the Doric and Ionic styles, as in the doorways of the Parthenon and the Erechtheum. Roman architecture makes less use of the feature, and it is very unlikely that it can have been introduced into this country from a Classical source. It is noteworthy that the openings at Monkwearmouth and Bradford-on-Avon, as well as the chancel arch at Escomb, are all straight-sided; but on the other hand the inclined jambs show themselves occasionally in buildings that are apparently late in the style. Had they been confined to the early examples we should have pronounced them with more confidence; it is somewhat surprising, however, to find them at Deerhurst Church, in Warden Tower, Northumberland, and in the tower of the fine example of Saxon stonework at Brigstock, in Rockingham Forest, Northamptonshire (fig. 39), none of which bear signs of any special antiquity. With fig. 36 may be compared the Irish window shown in fig. 41.

A final trait of similarity between old Saxon and Scotch-Irish work may be found in the occasional appearance in the latter of the special treatment of door-jambs, which, as we have seen, seems to precede the so-called "long-and-short" work in the external quoins. Fig. 40 shows an Irish doorway that may be compared in this respect with the example from Escomb in fig. 38, and with the jambs of the archways at Monkwearmouth. If this method of laying flat slabs upon upright occurred in the more rudely formed Saxon openings, it would be natural to suggest for it an Irish source. As a fact, however, the Escomb chancel arch, where it is very marked, as well as the Wearmouth doors are so careful and precise in their workmanship that they must either be Roman or inspired by Roman craftsmanship. Hence the balance of evidence would seem at present to incline towards a Classical origin for this particular form of stonework.

NOTES.

AT a meeting at the Society of Arts on Wednesday Professor Roberts-Austen read a paper on "Mural Painting," partly suggested by a recent correspondence in the *Times*, and recommending the system in which a soluble silicate is used as a vehicle, in place of the true fresco, with which such difficulties have been experienced in this climate. The lecture referred especially to the decorative paintings in the small church at Womersley, designed by Mr. Harrison Townsend, and decorated with paintings in the silicate process by Mrs. Anna Lea Merritt. Illustrations of the paintings were afterwards shown by the lantern. An interesting portion of the lecture consisted also in the illustration, by means of the lantern, of the actual construction, as it may be called, of the materials of the fresco as seen under the microscope. Mr. Holman Hunt, who occupied the chair, spoke strongly afterwards of the importance of finding a method which would allow of the successful prosecution of mural painting, without which we could hardly have grand art in England. By mural painting Mr. Hunt no doubt means painting actually on the walls; a point of some importance. The adoption in France of the easier system of painting on canvas which is subsequently affixed to the walls has led to a great deal of easel-painting, even what may be called *genre*-painting on a great scale, being substituted for the more severe style proper to true mural painting.

THE Board of Trade has just published a circular, in the form of a Parliamentary Blue-book, on the subject of the inconvenience caused to the travelling public by the ineffective manner in which station names are indicated on railway-stations. The circular, which is addressed to the railway companies

of the United Kingdom, refers to the practice of so surrounding the names of the stations with highly-coloured advertisements that they become obscured, and are with difficulty seen; but in the replies which have been received by the Board of Trade it is stated, in most cases, that the names of the stations are quite conspicuous, and a number of the companies express their willingness to adopt any reform that may be suggested. In fairness it cannot be said that the names of some of the London railway-stations are at all conspicuous, and until the names of approaching stations are automatically indicated in each compartment of every train, a clear space of several yards should be left around the name-board at a station, and the letters of the name should be very much larger than they are at present. A constant traveller on a particular railway can readily tell the names of stations at a glance and without the aid of the name-board, but casual passengers are often put to much inconvenience and annoyance in their futile efforts to discover, amid a wilderness of advertisements, the inconspicuous station name; and in the interests of those travellers it is to be hoped that some practical suggestion will speedily follow the circular of the Board of Trade.

THE case of the Fareham Electric Light Company v. The Fareham Urban District Council is a striking illustration of the folly and meanness by which local bodies are sometimes actuated. A contract had been made by the Fareham Local Board, whose duties were taken over by the Urban District Council, with the Electric Light Company, for the purchase of their undertaking. The new body repudiated the contract, and the action followed. All sorts of defences were raised, which were practically abandoned at the trial, which then came simply to an assessment of damages for the breach of the contract. The jury awarded £3,800 damages. It was absolutely clear that the District Council were bound by their predecessors' contract, and yet they saddled the ratepayers with the cost of a law-suit, and exposed their own want of business capacity. If local bodies could thus repudiate contracts made before the members for the time being are in office, it would put an end to all contracts with them. The present case will remind these smaller public bodies of their obligations, and it is to be hoped be a warning to them to act honourably and according to the law.

SINCE the equestrian statue has become so much vulgarised as a type of monument throughout Germany, several communities have adopted memorials in the form of a tower erected on a conspicuous position. One of these towers has been lately completed on the battlefield of Gravelotte, the necessary funds having been raised voluntarily by the citizens of Metz. The tower is 100 ft. high, and has cost about 1,500*l.*, Herr C. Wahn acting as architect. Its unpretentious design is very effective, and its outline excellent when seen from a distance against the sky. Architectural memorials of this kind are at all events an improvement on the cheap and bad sculptural work in which the smaller German communities have been indulging since the death of the Emperor William I. and on the occasion of the late anniversary of the Franco-German War.

SOME extensive warehouses and wharves are to be erected on the River Spree at Berlin, above and below the city in the east and west suburbs. These works will be partly a Municipal institution, partly a Government institution, and partly a commercial concern, as the City of Berlin is to provide the sites and build the wharves, the Government to supply the railway plant and make the connexions with the State railways, whilst the warehouses and sheds are to be built at the expense of the subscribers in-

terested, who will also have the responsibility of maintenance. The revenues will go to the subscribers to cover the cost of maintenance, and perhaps give an interest on the capital invested. The Chamber of Commerce proposes to represent the subscribers and act for them, and it is due to the efforts of this body that the matter has been put before the authorities. The total expenditure is to be about 500,000*l.*, of which 150,000*l.* will be required for the ground and 100,000*l.* for the principal blocks. Herr Schwabe is the author of the designs, and has prepared the estimates. These are based on the figures for similar schemes in other German cities on important inland waterways. Cologne has required 600,000*l.* for a similar scheme, Mannheim as much as 1,200,000*l.*, Mayence 400,000*l.*, Dusseldorf 500,000*l.*, and Dortmund is to have about 200,000*l.* The new warehouses and wharves are chiefly intended for the wheat traffic, the Berlin corn-dealers having complained of the insufficient warehouse accommodation, and their inability to provide it without Government and Municipal assistance.

WE are glad to see that electricians are beginning to realise that wood-casing, with numerous fuse-boxes attached to it, is by no means a perfect way of conveying electric wires to lamps in house-wiring. We have often had occasion to point out that this method is very unsightly. There are many hotels and other buildings which have been wired without the slightest attempt at preserving appearances, as if getting at the place where the lamp is to be fixed by the shortest route over moulding and cornice was the main consideration. Hence, what one of the papers read before the Institution of Electrical Engineers last week calls a glaring display of wood-casing and ugly crockery-ware. Anyone wanting good examples of this has only to see how numerous London shops are wired. Again, where the wood-casing is concealed there is often a reckless cutting at joists by the so-called wiremen to the possible weakening of the building. To guard against this, architects should always, when drawing plans for specifications, if there is any probability of the electric light being adopted, make ample provision in the way of conduits or channels for the electric light or power wires. These wireways would render the concealed wires always accessible, and also render harmless the rough and ready methods of detecting faults adopted by some wiremen. It would be a great boon to fire insurance inspectors, as at present any inspection of electric wiring after it has been closed in by lath and plaster is of no value. It would also do away with the methods of scamping work adopted by incompetent wiremen, illustrations of which from time to time appear in the electrical papers. Of course, when the lighting of a building is by both gas and electricity, the same conduit must not be used for both the gas-pipes and the wires. Now that high voltage is getting so common this is especially important, as even with the ordinary 100-volt supply on the three-wire system, the pressure between one of the wires and an adjacent gas-pipe is often nearly 200 volts. Many accidents, some of which have been serious, have arisen from this cause. When there is a 200-volt supply it is impossible to be too careful in keeping the gas and water-pipes well away from the electric wires and lamps.

WITH reference to our "Note," pp. 391-2, ante, upon the "overhead work" of the electrical tramway between Coventry and Bedworth, we may mention that the London United Tramways, Limited, intend to apply to the Board of Trade for a provisional order which shall authorise that company, with the London County Council's consent, "to place and maintain in or over the surface of any street, road, or place . . .

such posts, brackets, and wires as may be necessary or convenient for working the tramways of the company constructed or authorised . . . by electrical or other mechanical power"; and to render inapplicable to the company's undertaking the London Overhead Wires Act of 1891, and by-laws made in pursuance of that Act. It is to be feared that, unless decided steps are taken to oppose the overhead system, it will become a very serious nuisance and injury to the effect of streets and suburban roads.

THE Winter Exhibition of the Society of Painters in Water-colours is noticeable among other points for containing a rather unusual number of works dealing with architectural subjects. Among them Mr. Albert Goodwin's two beautiful views of the Taj Mahal may be first mentioned (147, 158), showing the building under two quite different aspects of light and colour. Mr. Goodwin also sends a very fine drawing of "Oxford" (214) as seen from the roof of the Radcliff Library, a fine drawing of Wells Cathedral (188), and a view of Whitby. Mr. T. M. Rooke exhibits a series of architectural sketches and studies in France. Mr. Abbey has a study of a Mediaeval castle (3), and a large sketch of an interior of "a German Church" (279). Mrs. Allingham's charming study of a row of high roofed red-brick cottages in Kent (182) may come under the same denomination, and there are other architectural subjects of more or less interest. Among the landscapes is an especially fine one by Mr. Phillip, "Pass of the Enterkin" (201). Mr. Hopkins's two studies of sea beating over rocks (246 and 263) are exceptionally successful. One of the most beautiful things in the collection is a portrait study of a head by Sir E. Burne-Jones (280). Miss Rose Barton sends, in "Old Chelsea Church" (190), an admirable study of street scenery. Mr. Wilmot Pilsbury's "Village Green" (258), though not belonging to the best and broadest school of water-colour, is a perfect piece of work in its way. Among other works worth special notice are Mrs. Allingham's "The Cuckoo" (30), with the foreground a mass of bluebells; Mr. Waterlow's "Return of the Flock" (66), Mr. R. W. Allan's "Cromarty" (106), Mr. Charles Gregory's "On the South Cliff, Rye" (154), and Mr. G. A. Frapp's "Moulsoford Ferry" (176).

THE exhibition of sketches by Mr. Peppercorn, at Goupil's Gallery, was in one sense a little disappointing, as Mr. Peppercorn has been known as an artist devoting himself a good deal to the study of special effects of light and atmosphere, and this collection consisted mainly of sketches in a broad and free style, but presenting no special characteristics. It contained, however, a considerable amount of good work in true and pure water-colour style.

THE Municipality of Berlin advertises for a city architect, in the place of Stadt Baurath Blankenstein, who retires from office. The salary will be 600*l.* (*sic*), in the case of the new director of the Municipal Gas Works, and we wonder what candidates will offer their services for this post. The work at Berlin is exceptionally onerous, as the scope of the architect's department is too large. Under Herr Blankenstein the architectural rendering of the municipal works was of a very low standard, though many of the buildings showed excellent planning, especially the new market halls and hospitals. We trust that the new official will use his influence to improve the appearance of the municipal buildings, though we cannot expect a high standard of design at 600*l.* per annum. At present a municipal work can always be recognised in Berlin by its uniform ugliness, and it is time that this should cease. Government work has been improving rapidly.

LETTER FROM PARIS.

We have already given the result of the competition for the rebuilding of the Cour des Comptes, the blackened walls of which will now at last disappear, having remained where they are since the war of 1871. Mr. Moyaux, the Inspecteur-général des Bâtiments Civils, is the architect who is to carry out the work; and his scheme is the one which corresponds best with the instructions, and which, by its simplicity, shows most respect to the original monument. He has confined himself as far as possible to the simple rebuilding of the original architecture, and has retained the old façades without modification, only modifying the interior plan so as to accord better with modern requirements.

The construction of the Rue Reaumur has rendered possible the complete disengagement of the Conservatoire des Arts et Métiers. At this point we come on a historic monument of the greatest value, the Chapel of the ancient priory of St. Martin-des-Champs, with the priory tower. The architectural interest of this chapel is well known to many of our readers. The apse is at present shut in by old and ugly houses, which are to be shortly demolished. There will be no need, however, of any danger to the chapel, except from its own at present very dilapidated condition, which requires immediate care. It is considered that it will be advisable in any case to restore the tower to its original height, and then utilise it as an annexe to the Conservatoire des Arts et Métiers. Much is expected—if we can get a sufficient vote from the Government—from the new architect in charge of the Conservatoire, M. Gerhardt, who has succeeded to M. Ancelet, and who is already engaged in making important modifications in the general arrangement of the Conservatoire and its collections, which are at present in an exceedingly crowded condition.

The work of reconstruction at the Sorbonne is advancing rapidly. The whole of the new buildings along Rue St. Jacques and Rue de la Sorbonne are completed. To the right and left of the chapel are two large arched bays which serve as a kind of transition link between the style of the church itself and that of the other façades. One of these leads to the Ecole Nationale des Chartes; the other to the Faculté des Sciences. The interior decoration is going on at the same time, the painters taking their turn now, and not the sculptors, as the Paris press has erroneously stated; the sculptors have done a good deal of their part already. A large work by M. Montenard, "La Méditerranée," is now being fixed in the Amphithéâtre de Minéralogie, and a picture by M. Gervey, "L'Orage," will shortly be fixed in the Amphithéâtre de Physique. M. Bessard is at work on a large symbolical composition, under the title, "De la Mort renaît la Vie"; M. Aimé Morot is engaged in the decoration of the anatomical lecture-room; and M. Carrière is to occupy himself with the lecture-room of "Enseignement Libre." M. Dagnan-Bouveret is to decorate the small Amphithéâtre des Lettres, M. Leon Glaize that of "Les Chartes," and M. Lhermitte will undertake the Salle des Facultés, the Dean's Gallery, and the large room of the library. There are still sixteen more statues to be commissioned before the completion of the works. With the splendid decoration of M. Favis de Chavannes, and the other works by some of the first painters of the day, the Sorbonne will be rather an exceptional building in regard to its decorations.

The appointment of M. Doumer as Minister of Finance is to be signalled by a reform in the French coinage. M. Roger Marx, Inspector-General of Museums and one of our best critics, has revived the subject and drawn up the programme. The Third French Republic, it must be remembered, has hitherto had no distinct coinage; the effigies on our silver and copper coins are old ones of little merit, dating from either 1792 or 1848; their symbolism is often incomprehensible and out of date. The anachronism seems the more unpardonable seeing that the art of medal-engraving never stood higher than in France at present, so much so that foreign nations are sending to our engravers for their coinage. The proposition of M. Marx has received the general support of the Press and of the Minister of Finance, who is himself an amateur in numismatics. The artists selected to design the new coinage are M. Chaplain for the gold pieces, M. Roty for the silver, and M. Daniel Dupuis for the copper. It will be a year, however, before the new coinage can be put into circulation.

The appointments of M. Chaplain and M. Roty in the above capacity will satisfy everyone, but the appointment, by the Minister of Fine Arts, of M. Chaplain to be director of the Sèvres

manufactory is rather open to criticism. The late director, M. Coutan, the sculptor, has just retired mainly because he recognised that his directorship was rather an empty name, as he had never studied ceramic work at all; and it is certain that M. Chaplain, though a splendid artist in his own class of work, is also quite unacquainted with ceramics, and knows nothing about the chemical and practical processes in connexion with the art. Some such artist as M. Bracquemond, M. Lachenal, or M. Delaherche, would have been better fitted for the position, and would have more claim to it.

The question of the three proposed lines of railway to facilitate transport in Paris is now before the Municipal Council, and if they accept the proposals, which we have already described, there will be a good beginning of the Paris Metropolitan railway system. The Minister of Commerce and Finance, at the same time, are laying before Parliament the "projet de loi" relative to the Exhibition of 1900. Nothing is altered as far as concerns the sites proposed by the General Committee, which we have already indicated. One of the special departments of the Exhibition, the Retrospective Exhibition, in place of being concentrated, as in 1889, will be divided among the various groups and classes, which will each have, as a vestibule, a kind of little museum exhibiting the progress made in that branch of work from the year 1800 to the end of the present century. In regard to exhibitors, the interior regulations will be as nearly as possible the same as in 1889, and the price of entry for the public has been fixed at one franc, as in the previous Exhibition.

The Carnavalet Museum has received an interesting collection of eight paintings, views of old Paris, executed by a distinguished architect, M. Hoffbauer, and forming some years ago a portion of the diorama of "Paris à Travers les Ages" at the Champs Elysées. These paintings are of real value both in an artistic and documentary sense. They have been presented to the City of Paris by M. Ambroise Firmin Didot, the well-known publisher. They represent:—

1. "Lutèce vers 460," a view in the valley of the Bievre.
2. The Hôtel de Ville and the Place de Grève in 1575.
3. The Louvre and its environs in 1572.
4. The Châteaue de la Tuilerie and its surroundings in 1594, at the moment of the entry of Henri IV.
5. The Hotel and the Tour de Nesle in 1543.
6. General View of Paris in the "Sixteenth Century" ("Journée des Barricades" in 1588).
7. The Cemetery of the Innocents in 1610 (Arrest of Ravallac).
8. The Palais de Justice and the Pont au Change in 1621.

The pictures have been installed, in their dioramic form, in the Hôtel de St. Fargeau, which has been acquired for the enlargement of the Carnavalet Museum.

The Académie des Beaux-Arts is proceeding to the election of a certain number of Honorary Corresponding Members, among whom we are glad to see that Mr. Orchardson, R.A., is nominated, to fill the place of the late M. Chenavard, of Lyons.

We have already referred to the death of M. Aldrophe, the architect, who has had a well-filled and successful career. He was born in 1834, and studied architecture under Bellange at the Ecole des Beaux-Arts. While still a young man he entered the service of the Paris Municipality, in 1855, under the orders of M. Balthard. In 1871 he became architecte-en-chef, and from that time filled an important position both as architect and official. His Jewish Synagogue in the Rue de la Victoire is a remarkable architectural conception, indicating talent of the first order. Besides his official work, he also carried out a number of special buildings, notably the hotel of Baron Rothschild, on Avenue Marigny, and the same owner's splendid chateau near Chantilly; the Hôtel Thiers in Place St. George, the Jewish Seminary in Rue Vauquelin, and the celebrated tomb of Thiers in Père Lachaise. He had been since 1881 a member of the Société Centrale, and in that year received the medal for "Architecture Privée."

The death is also announced of an artist of talent, Pierre Charles Comte, who had some celebrity at one time, though he has been forgotten by the present generation. He was a painter of historical pictures of the time of the sixteenth century, which had considerable success. He was seventy-two years old at the time of his death; he had for some time ceased to exhibit and lived in retirement at Fontainebleau.



Country House at Bar Harbour, Maine, U.S.A.

COUNTRY HOUSE AT BAR HARBOUR, MAINE.

THE sketch shows one of the class of small country houses to which Mr. Emerson and other American architects have imparted a certain character which may be recognised as specially American, though it is not perhaps easy to define in what it consists.

NOTES ON SOME RECENT RESTORATIONS IN BELGIUM:

BRUGES AND MECHLIN.

THE restorer—at least the church-restorer—does not seem to have been quite so busy during the last decade as in that preceding it. This is, on the whole, a matter for congratulation. Good results have been achieved, no doubt, in cases; nevertheless in Belgium no more than in England has restoration learned its limits; and still less has it perfected its technique over its much more various field.

Frenchmen express the sporting tastes of Englishmen by the sentiment they are pleased to put into our mouths:—"It is a fine day; let us kill something." There are evidences of a feeling among both the public and the profession in Belgium, which might be somewhat similarly expressed:—"This is a fine building; let us destroy something." The idea is on the wane, perhaps, but clearly it is not extinct. It is prompted, of course, by the plausible notion of reviving the original conditions of the fabric—as if an imitation could ever be as an original, even did a perfect record of the latter exist to work upon. In point of fact, these restorations have of necessity been largely conjectural, often injurious to the original structure, while fraught with losses of intermediate work. It is difficult to put oneself in the unhistoric and inartistic frame of mind which cheerfully effaces the hand-mark of generations from the buildings of the land, and substitutes for the genuine art of the last centuries the dubious "revivals" of our own.

Among the features thus sacrificed in Belgian churches—and notably in those of Bruges—are numerous altar-pieces of Renaissance character, florid, no doubt, and heavy, and strictly speaking, incongruous, but still rather grand and monumental, and eminently characteristic of the country. They have made way for works stylistically "correct," sometimes even of considerable merit, but generally small in scale, tame in treatment, and finicking in detail. The same want of vigour and originality stamps, for the most part, other accessories of recent introduction, while colour decoration is gay rather than rich in effect. Belgian churches are commonly so large (being, moreover, fully equipped to start with) that renovation seldom extends over the whole; but here a side-chapel, there a chapel is treated, a single altar replaced, or piece of furniture introduced. Hence arises a patchiness of effect and a loss of general harmony almost inevitable under the circumstances. For the sake of contrast, let me mention a building which appears, so far as the interior is concerned, to have

been pretty well let alone. This is the noble church of Notre Dame at Mechlin. It is not that it contains, like some Belgian churches, treasures of high art or antiquity; but such fittings as it has possess genuine character combined with a certain historic interest, and blend with one another and with the fabric itself in a pictorial, as distinct from a stylistic, unity. The great and simple proportions of the building, the pavement inlaid with vast sepulchral slabs in high relief, the old Renaissance marbles and woodwork, the reposeful air and slightly forlorn grandeur of the whole, are most impressive, the very absence of obtrusive modern care only enhancing the sense of bygone pieties more robust than our own. Widely different in date as are the fittings from the fabric, they are undoubtedly more in keeping with it than would be the professed Mediaevalism of the modern ecclesiastical furniture-shop.

Among works actually in progress in Bruges at the time of my visit, was a perilously thorough renovation of St. Jacques' north choir-aisle, which, unroofed and unglazed, looked as though it had suffered conflagration. The intention probably is to cover it with a wagon-head ceiling such as has already been placed—and with excellent effect—over portion of the church; nevertheless, the question arises whether an original roof of, say, the seventeenth or eighteenth century is not preferable to an imitative roof of the nineteenth. The desirableness of fitting the elegant window-openings with tracery is less open to doubt, though there would seem to be nothing but conjecture to guide the design.

The Early under-chapel of the Holy Blood was also in a condition of total denudation painful to see—the first stage, evidently, of a complete "restoration."

The interior of the Hôtel de Ville adjoining was likewise in the restorer's hands. The ground-story has already passed through them. Here (if memory serves me) was no antiquity to preserve, and the work, which is practically new *ab initio*, must be pronounced admirable—it has all the robustness and simplicity of old design.

The partial restoration of the great church of Lissewege, situate between Bruges and the sea-coast, was approaching completion. Without a precise recollection of its previous state, the conscientiousness of the restoration cannot properly be judged; but it is safe to say that the building had been badly used. At present, the brickwork of the walls and vaults of the eastern limbs has been exposed and pointed, and the ashlar dressings have been made good. The spic-and-span appearance of the whole suggests that the work might have been more conservatively carried out. The further question arises—how far is it right to strip brick walls of their covering? Was the brick-face the original and intended finish? Internal brickwork has always a somewhat crude effect. In itself, this of Lissewege is a very interesting specimen. It appears to date from before 1200, and is built in Flemish bond with blocks about 12 in. by 5½ in. by 3 in. The new rood, which had just arrived, is not of the best school of Belgian art.

An instance of over-zeal in restoration, coupled with deficient technique, might be seen at Mechlin, where the rich buttresses of the great tower were under treatment. That is to say, the substance of them was being mercilessly cut away and replaced with brand-new material: no tender consideration, no careful patching of the venerable stonework, but simple substitution of new for old. Part of the adjoining aisle has been refaced with stonework of lifeless regularity, the surface dressed in a manner quite unpractised of the Mediaeval mason. What happens to the time-worn fragments thus removed? Some of them perhaps find their way to the City Museum. This ossuary of architecture contains many interesting relics of local work. Yet when, some half-dozen years ago, the Malinois thought fit to abolish the ancient crane that stood upon their quay (one of the few survivals of its kind), they found no place for it in their Museum beside such other open-air objects as the gallows and pillory. Perhaps the association seemed too suggestive to the authors of the vandalism.

With respect to the Cathedral of Mechlin, the destruction of the trees on its south side is a further violation of æsthetic fitness and conservative feeling. They have made way for a paltry garden-plot laid out in miniature with starveling shrubs, and carefully fenced in with a stiff dwarf-railing of cast-iron. The effect is insignificant to a degree. On the other side of the church still stands a stately group of trees. Their regular ranks and solemn shade have an architectonic character befitting the position; while the constant and delicate motion of their summits seems happily to accentuate the majestic immobility of the giant tower overhead. It is impossible to conceive how anyone can have been so void of imagination, so wanting in a sense of grandeur and congruity, as to substitute the garden—and such a garden—for the grove. A similar vandalism was carried out some years ago at Bruges, when the trees about the churches of S. Sauveur and S. Gilles were cut down. Since then, the precincts of various Brugian churches have been partially enclosed and laid out. The idea of enclosure is a good one; but the posts and rails of the fencing are in general so very ugly, so aggressively modern, the laying-out of the ground is so fanciful, that the gain is doubtful. Surely it does not require special acuteness to perceive that a treatment which might set off a modern villa is wholly unsuitable to a Mediaeval church.

These operations in forestry may have been prompted by the opening-out fallacy which acts so detrimentally to "atmosphere" and "scale." Why is it that the first view of the vast Palais de Justice at Brussels—and, for the matter of that, of St. Peter's at Rome—is so unimpressive, relatively to the size of the buildings? Undoubtedly because of the extent of direct approach in both cases. I was informed that a clearance is contemplated in connexion with the Hôtel Gruythuyse at Bruges, involving the demolition of some picturesque old buildings. It is to be

hoped not. This interesting edifice has already suffered too much from a misconception of the restorer's duties. At the time of my visit, the uncompleted portion was reduced to a mere shell of masonry. Now the former state of the interior and its adaptation to fresh purposes may have required considerable changes to be made; but from the point of view of archaeology, a restoration which must be preceded by ruin had better be left undone. Moreover, the fine old weather-stained stone dormers have been completely rebuilt. Not only do they come brand-new from the hand of the nineteenth century workman, but a trace of Renaissance graft on the Gothic has vanished in the process. On the other hand, some of the completed apartments in this building are admirably fitted up with tiles, glazing, and other finishings of excellent character.

The cleansing of the once universal whitewash from the old façades in which Bruges is so rich proceeds as it has done during this last decade or two, exposing once more the beautiful brick-work of centuries, in tones varying from delicate yellow-pink in the older buildings to bright, rich red in the later ones. The gain in cheerfulness and warmth of effect is incalculable. Sometimes the process is accompanied by structural restoration, and an excellent example of this can be seen in a row of gable-fronts in the Rue aux Laines, where the green woodwork and touches of gold on the stone charmingly contrast with the light brick walling. At other times the new detail is tolerably by unskilled hands, and even where evidently "correct," the thing is often overdone. Excess of elaboration and want of repose is the general failing of recent works in Gothic style at Bruges, but these, various and important as they are, stand outside the province of these notes.

W. RANDOLPH.

DR. ROWAND ANDERSON ON ARCHITECTURAL EDUCATION.

In his Presidential address to the members of the Edinburgh Architectural Association last week Dr. Rowand Anderson dealt at some length with the question of compulsory examination, architectural education, and affiliation of provincial societies with the central Institute. On this subject, he said:

"There are certain changes impending and influences now at work that affect, not only our Association specially, but all who follow architecture and the allied arts, which we shall have to face and seriously consider. The first is the burning question of education and compulsory examination of qualifications for following the business of an architect, and second, the action of the Royal Institute of British Architects in London in dividing up the whole kingdom into architectural provinces or districts, in which the societies presently allied, or to be allied, to the Royal Institute would be the respective centres. It is officially stated that the object of this is to promote architectural education, to consolidate the profession by bringing into harmonious and united action its scattered and unorganised members, and by combining with the Royal Institute to promote the well-being of the whole profession. This I fear would not be the result. According to this scheme, the President of an allied society may have an ex-officio seat on the Council of the Royal Institute, and it is intended that the Fellowship of the Royal Institute shall be an indispensable qualification for holding the offices of president and vice-president of such allied societies. The constitutional rules and by-laws of allied societies must be approved of by the Royal Institute, and no addition or variation can be made on them without previous notice and approval by the Council of that body.

Now, how is all this going to affect our Association? I may state that the subject has been before our Council twice, and on both occasions it was decided to do nothing, but to remain as we are; doubtless, however, the matter will be brought up again. Our Association is in its constitution unlike most, if not all, other institutes or associations. These latter consist solely of people engaged in the business of architecture, and consequently having no voice in, or control of the affairs of the body. The Edinburgh Architectural Association, on the other hand, is a composite body and consists of architects and their assistants, painters, sculptors, decorators and all followers of the other arts, and in addition, a large number of lay members, who are interested in and support

the Association because of their love of art. We have a total membership of about 300. In this number are comprised ninety architects and their assistants, about sixty representatives of the allied arts, the remaining 150 being lay members. Any member of our Association, no matter what his occupation may be, is eligible as a member of council, and may fill the offices of president or vice-president.

You will see from this that there is an essential difference between our Association and all others. The latter are organised and exist almost exclusively for the benefit of architects. We exist for the benefit of architecture and the allied arts, and for this reason I consider our constitution the preferable one, and that the greater number of lay members we can induce to join us and to take an active part in the management of our affairs and work the greater will be our strength and influence.

One effect of affiliation with the Royal Institute would be to debar any member not an architect from holding office in our society, and if we fall in with this scheme the result will be that we must eventually become as other professional associations. This would, in my opinion, be a misfortune, as I believe that we can do and are doing more good for art and artists, by interesting and educating the public in a knowledge and appreciation of our work, and that it is better we should co-operate with a large body of the laity in spreading a knowledge and love of art, rather than confine ourselves to the interests of architects alone.

I cannot see what advantage it would be to us to have our rules and by-laws approved of by a central body in London, and to surrender the right to modify them without its consent. I should say we know our own minds, circumstances, and wants better than any body 400 miles away, and I see no advantages disclosed in the scheme that would compensate for the change that must follow in the present constitution of our body. I cannot but think that a central body in London controlling every society in the kingdom would have a disastrous effect. In art, vigour, activity, progress, and that elasticity requisite for adjusting itself to the constantly-changing circumstances of time, society, and locality, can only exist and flourish in freedom, and even the reaction on the central body in London would be equally bad. The business could not be carried on without a paid staff, who would speedily capture the whole management and initiate a lifeless and crushing routine, throwing back the progress now at work for many a year.

But something more serious is waiting your consideration. There is a rival society, in London, to the Royal Institute, called "The Society of Architects and Surveyors." This body has now before Parliament a Bill to provide for the compulsory registration of architects. The leading provisions of this Bill are:—

1. That anyone calling himself an architect and in practice after the first day of January, 1896, will be subjected to a penalty of from 20*l.* to 50*l.* unless he is registered.

2. A compulsory examination as to qualifications is to be essential.

3. No person can recover fees as an architect unless he is registered.

4. No person can hold any appointment under any city or urban sanitary authority, or the like, in relation to the preparation of plans and sanitary or structural arrangements unless he is registered.

5. There is a liberal provision of fines and imprisonment for circumvention and breaches of the Act.

As an inducement to support this Bill, it is stated that a large number of practising architects will be represented on the General Council of the new body, and that there will be a number of appointments to be competed for, such as registrars, secretaries, and treasurers, clerks and servants to the General and Branch Councils. All the officials are to be paid, and also all fees and travelling expenses for attendance at Council meetings.

Four Members of Parliament back the Bill. How many more will support it remains to be seen. Of course the Royal Institute and many other societies will petition against the Bill, but one must remember that there is an overwhelming majority of people calling themselves architects outside the Institute, who, with the prospect of lucrative appointments dangling before them, may support this Bill.

While I think the whole thing utterly bad and unworkable it may receive support, particularly as what this Bill proposes to do is the logical outcome of the present educational movement, for you cannot force people to undergo a special

training over and above ordinary education as a qualifying condition for earning their living, unless you give them certain privileges and advantages in return, which will exclude from their field of operations all so-called unqualified competitors. And this brings me to the burning question of education and compulsory examination.

It is, perhaps, a little difficult to argue out this quite freely without suggesting to some that one is opposed to education. This is not so.

Primary, secondary, or University education is not to be called in question. It is the education of an architect in those specialties that are said to be necessary for the successful carrying on of his business, and for the protection of the people who are to employ him, with which we have to deal.

This is undoubtedly a problem which for some time will be the subject of much difference of opinion. It has divided architects into two camps, each holding very strong views and having much to say in support of them. In dealing with this question I wish to avoid dogmatism and rather to contribute to the clearing up of a confessedly difficult problem such thoughts as have occurred to me from time to time. Those who advocate this special education and compulsory examination say that the ranks are crowded with incompetent and badly-educated men and that consequently the good men and their art suffer in prestige and public estimation; that the public should be protected from this incompetent class; and that the only way to do so is to insist on special education, and its possession to be tested by compulsory examination before one begins business.

In working out this question one must keep in view one or two points.

1st. All the old buildings to which we look for inspiration were erected without anyone corresponding to the modern architect.

2nd. Admittedly many of the best architects of modern times are not the product of competitive examinations, and decline to countenance this new departure.

3rd. It is said that it is quite as necessary for an architect as for a divine, a lawyer, or a doctor, but at the same time it is admitted that the possession of the creative and artistic power necessary to make an architect cannot be discovered by compulsory examinations.

4th. That probably about 90 per cent. of the building executed in this country is done without the intervention of an architect, and that there is, therefore, only about 10 per cent. of building on which architects are employed.

Such work is carried out for a class more or less possessed of means and education, and who are not only able to take care of themselves, but who insist on controlling the architect, often very much to his sorrow; so much so that protection is frequently wanted more by the architect than the client. How often pressure is put upon one to carry out work in a much less substantial manner than one likes to do it, and how often even the architectural treatment is interfered with by the client, who tells you that what he insists on having is what he must have; that he knows what pleases him, and he is paying for it. Do you think that a few letters after one's name will change all this? I fear not, and that the client will still insist in having his views carried out, even in spite of your qualifications having been tested by examination.

Now, so far as protecting the public against those who design and erect buildings is necessary, it appears to me that those who erect the 90 per cent. of buildings are the proper subjects on whom to impose a qualifying examination, because, at present, the public have little or no control in the planning or designing of what they have to buy and live in.

Such works are put into the market by capitalists, speculative builders, and others who say they know what the public wants, and they endeavour to give them plenty for their money; and it often puzzles me to know how they do it; and until the present ideas and estimate of the value of art and sound construction held by the masses change for the better, no compulsory standard of education imposed on architects will alter the relative proportion of the work done by architects and by builders.

Again, if the architect must be subjected to a compulsory examination as to his qualifications, what is to be done with the mason and carpenter and all the other tradesmen who carry out his designs? Are they to remain unqualified and irresponsible? because it is of more importance that the man who carries out the work from the drawings should be compulsorily examined as to his qualifications. Here, again, if any prote-

tion is needed, the architect requires it. Often he is placed at the mercy of contractors who are forced upon him by the insane desire of public bodies and individuals to accept the lowest estimate, irrespective of character, financial standing, or experience. In the event of the business of an architect becoming a close one—and this is no doubt the ultimate object in view—what will happen? One more profession will be added to the list, access to which can only be obtained through the one portal of compulsory examination. You then bring into the field a class of men—and they are already at work here—who, by the declaration of the number of their successful passes, get you to believe that they can pilot you into the charmed circle, and they can do so unless you are uncommonly stupid. Once the profession of Art becomes a close one, and those who follow it are hall-marked by public bodies authorised to do so, numbers will flock to it, not because they possess the essential qualifications, but because they can pass the qualifying examination; and our latter state will be no better than our present one. If by reason of the overcrowding of the profession the examination is made more severe, it is only in science, and history, and one or two minor matters that this can be done; but that will never demonstrate that the candidate possesses that intuitive sense of fitness and power of adaptation of means to an end, the creative power, the imagination and inventiveness, the keen sense of proportion and the harmonies of colour, all of which attributes combine to make the true architect. These may be absolutely wanting, because no compulsory examination can prove their existence, and yet the candidate will force his way through the gateway.

The analogy of the divine, the lawyer, and the doctor, is not applicable. In the case of the divine, he must be educated in a certain theology, and must be examined as to his knowledge of it, because he has to sign a declaration of his belief in it. In law and medicine, what the country does is to ensure that the laws of the realm will be interpreted and administered by a body of men specially educated; but a knowledge of the law does not guarantee sound judgments or wise counsel. In the case of medicine and public health, the country so far protects the lives of its citizens by seeing that there is a body of men educated up to the standards of the day in such matters, but it does not guarantee that the physician will diagnose correctly or the surgeon operate successfully: and you need not expect that the Government will ever interfere to protect you from bad art in buildings any more than from buying bad pictures.

Art cannot spring up and flourish at the dictation and under the guidance of a central bureau. If it is to have any value or reality it must be the spontaneous outcome of the genius of the people, and it will vary with locality, traditions, the influences of literature and science, and many other things.

The solution of the question seems to me to lie in the increasing high standard of education for all classes, and the greater elaboration of the Building and Police Acts, and their stringent application by competent officials, alike to the architect, the builder, and the public. This will give all the protection that is necessary. But as far as protecting the public from the effects of bad art is in question, no amount of legislation can do that. Indeed, by far the larger part of the public don't want good art. They want what pleases them, and plenty of it for their money.

Art, and those who live by it, can only flourish and progress in absolute freedom and under the influence of a healthy public opinion. The public are our employers and paymasters, and they will always insist on and get what seems to them to be the right thing. At times it may be that they ask for what is utterly bad, and they will always get people to supply it; but where the people are educated, and their instincts are natural, they will ask only for what is good and true. Then, and not until then, will architecture and all its allied arts be in a healthy condition, and the incompetent and bad artist will disappear without the aid of compulsory examinations and diplomas."

PULPIT, ST. JOHN'S CHURCH, BOSCOMBE.

THE illustration represents the upper portion of a pulpit executed by Messrs. Harry Hems & Sons for St. John's Church, Boscombe. Messrs. J. Oldrid Scott and C. T. Miles are the joint architects for the church.



Pulpit, St. John's Church, Boscombe.

INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting of this Institution on the 19th ult. Sir Benjamin Baker, K.C.M.G., the President, in the Chair, the paper read was entitled "The City and South London Railway, with some Remarks on Subaqueous Tunnelling by Shield and Compressed Air," by Mr. J. H. Greathead, M.Inst.C.E.

The Act of Parliament authorising the construction of the City of London and Southwark Subway between King William-street, City, and the "Elephant and Castle," Newington, was passed in 1884, and in 1887 powers were granted for the extension of the line to Stockwell. Starting at King William-street, near the Monument, at a depth of about 70 ft. below the surface, the railway ran under the river Thames at a maximum depth of 73 ft. below high-water level, and under the southern approach to London Bridge southwards to the junction of the South Lambeth- and Stockwell-roads. The two lines were, excepting at the termini, carried in separate tunnels.

A temporary stage and shaft having been constructed in the river, immediately behind the Old Swan Pier, near London Bridge, the shield for driving the upper tunnel was lowered into position, and tunnelling was commenced southwards in clay. The second tunnel was started from the temporary shaft at Old Swan Pier immediately underneath the first, but was brought to the same level as the first at the south bank of the river, and then carried parallel with it under Hibernia Chambers and the South-Eastern Railway. On the completion of the iron tunnels under the river, the 25-ft. lift-shafts at the "Borough" and "Elephant and Castle" stations, to be used in the construction of the tunnels, were sunk. Headings were driven under the street at right angles to the course of the railway, and four shields were lowered and rolled into position for driving the two tunnels north and south. The extension works were carried on at three points, viz., Kennington, the Oval, and Stockwell, and the operations on both sections proceeded

simultaneously until the City section was completed. The tunnels on the first or City section were 10 ft. 2 in. in diameter, and were composed of rings 1 ft. 7 in. long, each consisting of six segments and a key-piece. Southwards of the "Elephant and Castle," the tunnels were 10 ft. 6 in. in diameter, in rings 1 ft. 8 in. long. At each of the stations for the length of the platforms, and at the termini for a greater length, enlarged tunnels were constructed in brickwork. At the termini these tunnels were 26 ft. wide and 20 ft. high from invert to crown, with walls 3 ft. thick. At the intermediate stations there were two 20-ft. wide tunnels, 16 ft. high from invert to crown. Access to the railway was obtained by lifts of which there were two in the 25-ft. shaft at each station, the depths varying between 43 ft. Stockwell and 67 ft. at King William-street. The trains were driven by electrical locomotives which received power from a conductor placed upon insulated supports between the two rails. The signals were of the usual type, the absolute block-system being employed. The trains were lighted by electric incandescent lamps supplied from the main circuit.

A historical account was given of the use of the shield and of compressed air in tunnelling. The shield used for the 10-foot 6-in. tunnels between the "Elephant and Castle" and Stockwell consisted of a cylinder, 5 ft. 11 in. long, of steel plates in two thicknesses of $\frac{1}{2}$ -in. each, riveted together to break joint with rivets countersunk on both sides. This cylinder was bolted to a strong ring of cast-iron at the front end, and to this ring were bolted the plates and channel-irons forming the face, and the adjustable steel cutters. The latter were so attached that they could be adjusted to cut out the excavation to the same diameter as, or wider than, the steel cylinder following them; the latter provision being necessary for passing round curves in any direction, either horizontal or vertical. The inside of the cylinder in rear of the face was lined with cast-iron segments, and to these were bolted six hydraulic presses of 6 $\frac{1}{2}$ in. diameter. The

shields were at first made to do no excavation beyond the shearing off by the adjustable cutters of a thin slice of material round the circumference, but subsequently in driving through clay, the author introduced a series of wedges or piles in front of the face. The effect was to expedite the work and reduce its cost materially, the speed being practically doubled. The wedges were free to pass by the nodules of septaria, common in the London clay, without unduly straining the shield or presses. Grout of blue lias lime was forced by compressed air through holes in the cast-iron lining provided for the purpose. This was found to be a very important factor in the work—not only for preventing movements overhead and deformation of the tunnels, but also for several other purposes. The supply of compressed air used for grouting also afforded the means for ventilating the long tunnels during construction. In the earlier parts of the work a timber flooring was laid upon long temporary sleepers, resting at their ends upon the iron lining, and the excavated material was run out, and the iron, &c., brought in by manual labor. Subsequently the flooring was abandoned, the invert was filled with clay, and the work was accomplished by ponies upon a very unsatisfactory road.

At several points on the two sections of the railway compressed air was employed in passing through water-bearing strata. The most notable case was near the south end of the railway at Stockwell, where for a length of about 200 yds. the two tunnels were carried through coarse gravel and sand under a head of about 35 ft. of water. The tunnels were driven under normal air-pressure to a point where the cover of clay was reduced to about 5 ft., whence, the air-locks having been erected, they were continued under compressed air. It was generally found that the ballast immediately overlying the clay contained less sand, and that of a coarser character, than in other positions, and it was in passing through this very open material that the work was most difficult. With such material as silt or fine sand, there was not much difficulty, provided there was a sufficient cover of material, because the porosity was not so great as to allow of the escape of a large volume of air, while maintaining a pressure sufficient to keep the bottom sufficiently dry; but in very coarse sand it was impossible to maintain a pressure much higher than that due to the head of water over the top of the tunnel without special appliances and precautions. The difficulty consisted in having to work upon, so as to remove, the material from the front of the shield for the whole height of the face, and at the same time to prevent the inflow of a large volume of water, or the escape of an inordinate volume of air. In porous material, therefore, where a large volume was to be expected, and the conditions were such as to render pumping impracticable, compressed air was only to be considered if means could be found for preventing its too rapid escape.

The shield having been brought to the water-bearing strata, a small heading was driven at the top in advance, stout poling-boards being used to support the top, resting at one end upon the forward end of the shield. The heading was then widened out and the polings continued until about three-fourths of the circumference and the whole of the face had been poled. The two tunnels were driven side by side, under the large mains of the Lambeth and the Southwark and Vauxhall Water Companies, supplying an extensive area of South London, and under sewers and railways without the slightest disturbance, and the system adopted had since been followed in driving several tunnels under the Clyde and elsewhere in Glasgow through sand, silt, &c.

It was sometimes advisable, and even necessary, to work with an air-pressure below that due to the maximum head of water in the material at the face. The workmen were thus benefited, and in some cases the work might be more safely carried out, as where there was a comparatively small cover of loose material under a river. In this latter case, a pressure in the tunnel corresponding to that of the head of water at the lowest point of the face being in excess of that due to the head of water at the highest point of the face by an amount depending upon the height of the tunnel, or of the portion of the face operated upon, would, in some cases, be sufficient to lift or blow up the cover at the face, unless other precautions were taken. The first air-lock used was of iron fixed in a bulkhead of brickwork. It was small and inconvenient, and the later air-locks were formed by reducing the size of the iron tunnel by a thick lining of brickwork and concrete.

The workmen employed in the compressed air on the City and South London Railway did not suffer from partial paralysis or "bends." The pressure was not high—about 15 lbs. per square inch—but from observations on this and other works the author considered that purity or impurity of air had, perhaps, more effect than pressure upon the health of the men engaged, provided due precautions were taken as to entrance and exit, the avoidance of chills, &c. It was noticeable that when tunnels had been driven through almost impervious material, as under the Hudson and St. Clair Rivers, and where, consequently, the quantity of air pumped had been comparatively small, the cases of "bends" were numerous, while in the gravel in London, both at the City and South London Railway, and more recently, at the Blackwall Tunnel, with a higher pressure, there were in the one no cases at all, and in the other no fatal cases had occurred. Where tunnelling was proceeding in fine sand or in silt, which were almost air-tight, the delivery pipes from the compressors should be extended to the face, so that the work progressed, in order that the air used in locking might assist the ventilation of the whole tunnel, and provision should be made for a copious supply of air to be delivered at the face. The more highly compressed air employed for grouting was useful for this purpose and for cooling the air, by expansion through a throttled passage, at the same time. This supply had on a serious emergency proved invaluable. In carrying the tunnels of the Glasgow Subway under the Clyde at St. Enoch's a fire occurred, filling the tunnel with suffocating gases and cutting off the men from the air-lock; and but for the air from the hose of the grouting-apparatus the whole gang would have perished. By lying down and receiving the air in their faces the men were able to live during the several hours that it took to reach them by breaking through from the second tunnel. A list was given, in an Appendix to the Paper, of the cylindrical iron-lined tunnels which had been similarly executed in various parts of the world.

At the meeting of the Institution on the 3rd inst., two papers dealing with the physical properties of iron and steel were read. The first paper was by Mr. John O. Arnold, F.C.S., and was entitled "The Influence of Carbon on Iron"; and the second, by Mr. T. Wrightson, M.Inst.C.E., was entitled "The Dilatation, Annealing, and Welding of Iron and Steel."

At the same meeting it was announced that fourteen Associate Members had been transferred to the class of Members, and that ninety-three candidates had been admitted as students. The first ballot of the session resulted in the election of five Members and 106 Associate Members, and of eight Associates.

ARCHITECTURAL UNION COMPANY, LIMITED.

THE thirty-eighth annual ordinary general meeting of this company was held on Wednesday, at 9, Conduit-street, Regent-street, under the presidency of Mr. James Edmeston.

The Chairman moved the adoption of the report, from which we give the following extracts:—"The directors regret to have to report that the rent of the Conduit-street Galleries having fallen into arrear, and Mr. Marriott being unable to continue his business, they have been compelled to accept a surrender of the lease, which was originally granted to Messrs. Freeman & Marriott. The directors are unable at present to say how much, if any, of the arrears are likely to be recovered from Mr. Marriott, but as Mr. Freeman was also liable under the lease, they have made fresh arrangements as to his remuneration, with a view to obtaining a partial recoupment. The directors have the satisfaction of announcing that negotiations are now in progress for reletting the Conduit-street and Maddox-street Galleries at a satisfactory rental. The Maddox-street Galleries having remained unlet during the past year, and the Conduit-street rent having been unpaid since the 25th March, and it also being desirable that, under existing circumstances, a larger cash balance than usual should be retained in hand, the directors recommend a dividend of 5s. per share only, for the present year."

Mr. Arthur Cates seconded the motion.

Replying to Mr. J. McVicar Anderson, who, along with Mr. Webb, represented the Institute, the Chairman stated that the adoption of the report would not commit the shareholders to anything. The report simply stated that negotiations were now in progress for reletting the Conduit-street and Maddox-street Galleries, and it was

proposed that this matter should be dealt with after the transaction of the ordinary business.

Mr. Cecil F. J. Jennings (a director) contended that at the present moment there was a binding contract in existence, but nothing stated in the report could bind them.

The report was then adopted, and the retiring directors and auditors were re-elected.

Mr. J. McVicar Anderson moved the following resolution:—"That as a regulation under article 58 of the Company's articles, the directors be required not to let the galleries which form part of the building known as 9, Conduit-street, for any trade purposes, or to any tenants other than those mentioned in the company's share prospectus, so long as any such tenants desire to occupy them on reasonable terms." He understood it was proposed, although an offer had been put in on behalf of the Royal Institute of British Architects, to let the galleries to an outside firm of auctioneers. The prospectus of the company, which was issued in September, 1857, stated:—"This company is formed for the express purpose of providing a building suitable for the different societies connected with the art of architecture. The main object of the company will be to devote the whole of the premises to art, or scientific societies of a kindred character." The articles of association stated the company was established "for the purpose of providing accommodation for the different societies connected with architecture, and especially for the Royal Institute of British Architects, and the Architectural Exhibition." The memorandum of association, which, it was said, superseded these, although he very much doubted it, gave the directors power "to hire or purchase or erect new premises or hire or purchase old premises in order to form public and private meeting-rooms, galleries for exhibitions, or for holding large meetings of persons for all societies connected directly or indirectly with the architectural profession, art or science, and also for sub-letting or otherwise disposing of any part of the premises not required for the above purposes, as offices, club chambers, shops, or otherwise." It was obvious, therefore, that the Company was formed for the purpose of providing a home for art societies, and especially for the Royal Institute of British Architects, and the directors were morally bound, as honourable men, to maintain and abide by the plain spirit of their constitution. The Royal Institute of British Architects had paid their rent regularly, and, moreover, they had spent large sums of money in improving the premises. To let the galleries to auctioneers would, he maintained, be to act in direct defiance of the constitution, and would also be a breach of contract with the Royal Institute of British Architects.

Mr. Webb, in seconding the resolution, said he was authorised by the Council of the Royal Institute of British Architects to make a substantial offer of 700l. a year for the galleries. He sent that offer to the Chairman of the Company, and he had reason to know that it was duly laid before the Board and considered by them.

The Chairman stated that the firm of auctioneers referred to had expressed their willingness to give 750l. a year for the galleries. They had furnished references, but he believed they had not been in business before.

Mr. Anderson remarked that the directors surely did not consider an additional 50l. a sufficient inducement to let the premises to other people.

Mr. Cecil F. J. Jennings said there were 1,100 shares in the company, and he had received proxies to the extent of 593. It had been said that an offer to take the premises was made by the Royal Institute of British Architects, but that was not the case; it was only a tentative proposal, which might never be carried out. He held, therefore, that the directors were not justified in refusing a definite offer. They were bound as directors by the memorandum of association, and not by the prospectus, which was an absolutely non-existent document. If there was a breach of contract, the Institute had its remedy. The advantages to the Company of the proposed new arrangement were that the shareholders would get a better dividend; and that they would secure two tenants instead of one.

Mr. Dawson having spoken in favour of the resolution,

Mr. Cates said he thought the directors were under a moral obligation, as far as was consistent with their duties to the shareholders, to carry out the objects which were in the minds of those who promoted the Company. He had not been



Hôtel Métropole, Cromer. Messrs. G. J. & F. W. Skipper, Architects.

present at the Board meetings lately, owing to absence from town, and it was with considerable surprise he heard that an offer from a firm of auctioneers had been considered and accepted.

The resolution was carried, on a show of hands, by 5 votes to 3.

Mr. Jennings announced his intention of convening a special meeting of the Company to rescind the resolution.

HÔTEL MÉTROPOLE, CROMER.

WE give the plan and a view of the street-front of this building, which has been erected in a central position on the summit of the cliff at Cromer, facing the sea, commanding most magnificent sea views, and having direct communication through its own grounds with the promenade and beach below.

The plan indicates the general arrangement of the ground floor, which is mainly occupied by entrance-hall, dining-hall, drawing-room, manager's room, &c. The decorations of these apartments have been carried out in Japanese and Cordelova wall-hangings. The woodwork is chiefly of walnut. The entrance-hall has a canopied oak chimney-piece reaching from floor to ceiling.

The staircases are constructed entirely of stone, with wrought-iron and copper scrollwork balustrading. A hydraulic passenger lift, supplied by Messrs. Waygood & Co., runs to the top floors. The natural fall of the ground allows of billiard-room, reading and smoking-room, and

private dining-room being placed under the dining-hall and drawing-room, thus obtaining for these rooms sea-views also. The gentlemen's cloak-room and lavatory are on this floor, and so are the kitchens and most of the offices. In a basement floor are the steward's room, servants' hall, &c.

The first, second, third, and fourth floors are occupied by bedrooms and private sitting-rooms, nearly all of which have been so arranged as to command good sea views. A feature of the scheme is the terrace arranged over the dining-hall, which is of easy access from the principal rooms of the building, affording an attractive resort for visitors who desire to enjoy the sea air and scenery without leaving the precincts of the building.

The sanitary arrangements have been carried out on the most modern and approved principles, and fire-hydrants are placed on every floor. The building has been furnished throughout by Messrs. Trevor, Page, & Co., Norwich, who also executed the chimney-pieces from designs supplied by the architects.

Externally the building is of red brick, and the roofs are covered with green slates. The decorative portions of the brickwork have been executed by Mr. G. Gunton, of Costessey, whilst the carving is the work of Mr. Minns, of Norwich. Messrs. Youngs & Son, of Norwich, are the builders.

The architects are Messrs. G. J. & F. W. Skipper, of Norwich and Cromer, from whose plans and under whose superintendence the

whole of the work, including the interior decorations, has been carried out. Mr. W. J. Bayes acted as clerk of the works.

THE BUILDERS' BENEVOLENT INSTITUTION:

ELECTION OF PENSIONERS.

THE election of three pensioners on the fund of this charity took place on the 28th ult. at the offices of the Institution, 35, Southampton-row, Bloomsbury-square. Mr. J. Mowlem Burt, J.P., D.L. (President), occupied the chair, and amongst other friends of the Institution, there were present Mr. J. T. Bolding, Mr. T. Stirling, Mr. T. Stirling, jun., Mr. T. F. Rider, Mr. J. Howard Colls, Mr. C. Bussell, and Mr. F. Foxley. There were three vacancies for pensions, viz., for two men and one woman, there being three men and five women applicants.

At the close of the poll, the scrutineers (Messrs. T. Stirling and T. F. Rider) announced the result, which was as follows:—William Langridge, aged 76, builder, 18, Dorville-road, Hammersmith (first application), 1,817 votes; Thomas Warner, aged 68, builder, 114, Brecknock-road, N. (first application), 1,216 votes; Arthur Fuller Smith, aged 65, builder, 53, Mayfield-road, Dalston (first application), 109 votes; Mary Ann Healing, 20, Curtain-road, aged 65, widow of Samuel T. Healing, builder (sixth application), 850 votes; Maria Elizabeth Powell, 281, Albany-road, Camberwell, aged 62, widow of G. T. Powell, late a



Scale of 10 Feet
Hotel Metropole, Cromer.—11th.

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|--------------|-------------|-------------|-------------------|
| 1. Shop. | 6. Serving. | 8. Lift. | 11. Manager. |
| 2. Entrance. | 7. Arc. | 9. Hall. | 12. Dining Hall. |
| 3. Shop. | | 10. Bureau. | 13. Drawing Room. |
| 4. Shop. | | | |

pensioner of the Institution (third application), 2,702 votes; Mary Ann Bowley, Tylers Cottages, Ball's Pond, aged 68, widow of J. Bowley, late a pensioner of the Institution (second application), 763 votes; Eliza Ellis, 46, James-street, Oxford-street, aged 76, widow of E. G. Ellis, builder, (second application), 1,428 votes; and Ellen Batchelder, Camden-road, Carshalton, aged 62, widow of Charles Batchelder, builder (second application), 723 votes. The successful candidates were, therefore, William Langridge, Thomas Warne, and Maria Elizabeth Powell.

Votes of thanks were passed to the chairman and the scrutineers, and the proceedings terminated.

THE BERLIN INDUSTRIAL EXHIBITION.

THE importance of the Industrial Exhibition, which will be held at Berlin next year can scarcely be overrated, and there is little doubt of its being a great success. Everything from the initial organisation has been systematically and quietly done, and great care has been taken to avoid any trumpeting, or exaggeration of the scheme which might lead to disappointments, as was the case at Chicago. The site which was the subject of such acrimonious discussion can be considered a successful one, and the executive, with its able staff of architects is exceptionally powerful, the Works Department including the names of Bruno Schmitz, Karl Hoffacker, Herr Griesback, and Herr Schring. The funds are ample, and if there is any drawback it is only the want of quick transit from the centre of the

metropolis to the grounds, which is, however, now being rapidly overcome by the construction of electric trams and railways.

The Exhibition has the patronage of the Government, and this means much in a country where the public authorities are conscious of their responsibilities and power as regards improving national trade. Every possible facility is being given to the executive by the Government, even to the extent of officially calling the attention of all German "Colonies" resident in other countries to the show, by the aid of consular notices, and granting the concession of a lottery which is an invaluable adjunct for the budget. The municipality of Berlin voted 17,500*l.* towards the preliminary expenses and is now spending another 125,000*l.* in improving the roads to the grounds. Another 50,000*l.* is being spent in the same way by county or rural authorities who expect a handsome profit for their ratepayers. About 100,000*l.* are being spent on a new railway station and the connexion of the grounds with the Metropolitan Overhead Railway; and the expenditure on the rapid construction of the electric railway and tramways will be very high.

The superficial area of the grounds is practically the same as the area of the Paris Exhibition grounds of 1889, and the site is very wisely on the banks of the River Spree which forms one of the boundaries of the site and at the same time gives ample opportunity for passenger steamer traffic from various parts of the city. Railway embankments form the other boundaries. Comparatively speaking, the superficial area covered by the building will not be as

large as at the great international fairs, as the scope of the Exhibition is limited to German Industries, and primarily to Berlin work. Nevertheless, the main building will cover about 40,000 square metres, and there are blocks devoted to special sections, such as chemistry, which have frontages of 300 to 400 ft. The main building, it is understood, has been partially transferred from Antwerp, some of the old constructional parts being utilised. The largest spaces in the block have been given to electricity and general machinery divisions, the general metal, and wood industries, and the manufacture of wearing apparel. It would be premature to explain the division of the groups and sections, as there are sure to be numerous alterations in the programme before the opening day in May next, but it would be well to point out that the building trades and the arts and crafts take an important position in the Exhibition, coming second only to the machinery section and iron industries. Public works offices, such as the Municipal Building Department, will be most elaborately represented, the latter having gone to the expense of erecting a special building on a prominent position.

The pleasure side of the Exhibition has also received careful attention, one of the great features being a very well-planned scheme of "Old Berlin," and another of "Old Cairo," which covers an area of 35,000 square feet. Great care has been taken to keep the "fair" element outside the boundaries of the Exhibition proper, adjoining sites having been put at the disposal of the caterers of public amusements. The Exhibition theatre is preparing rapidly, and likewise the large assembly-hall, and the numerous "beer palaces."

Over two thousand workmen have been regularly employed of late on the Exhibition grounds proper, and there is every reason to expect the punctual completion of the works. As in the case of all the minor exhibitions in Germany of late years, no attempt is being made to imitate palatial structures, but the *bomb-fide* temporary construction is being shown.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A BUSINESS meeting of this Institute was held on Monday at No. 9, Conduit-street, Regent-street, Mr. Alex. Graham, F.S.A., Vice-President, in the chair.

The Chairman announced that at the Preliminary Examination held in London, Liverpool, and Newcastle on the 12th and 13th ult., 59 applicants had been exempted from attending; and out of the 63 examined, 37 passed, and the remaining 26 were relegated to their studies. The total number examined in London was 44, of whom 26 passed; in Liverpool 14, of whom 7 passed; and in Newcastle 5, of whom 4 passed. The following are the names of the 96 newly-registered Probationers:—

J. T. Alexander, North Shields; W. K. Anderson, Glasgow; H. P. R. Anson, Denmark Hill; R. D. Baillie, Cupar, Fife; G. L. Baillie-Hamilton, Waverton Rectory, near Chester; J. H. de C. Ballardie, Harrogate; Chevalier W. Beaumont, Tulse Hill, S.W.; C. H. Bennett, Birch Vale, near Stockport; D. H. Bentley, Richmond; C. G. Blood, Liverpool; A. B. Botterill, Weston-super-Mare; W. H. Bourne, Darlington; P. J. Bradshaw, Stamford; E. W. Bratt, Wednesbury; C. H. E. Bridgen, Tunbridge Wells; L. L. Bright, Nottingham; S. M. Brooks, Clapham Park; W. H. Brown, Bayswater; E. A. Campbell, Twyford; H. Cayley, Cambridge; A. S. Collard, Egrement; G. Colles, Cheadle Hulme, Stockport; H. L. Emile Merille de Colleville, Brighton; F. Cooper, Bolton; J. N. Cornack, Edinburgh; H. D. Crewdson, Alderley Edge; L. S. Crosbie, Camberwell; E. Dakers, Dundee; E. Xavier Aimé Dammany, London; W. C. Dickinson, Islington; G. R. Ellis, Millfield, Peterborough; P. H. Finney, Derby; J. A. Fletcher, Halifax; G. Fordyce, Aberdeen; R. A. Galloway, Edinburgh; K. Gammell, Weston-super-Mare; W. Gauldie, Dundee; A. E. Gibbins, Brighton; J. H. Gibbons, Manchester; T. H. Gibbs, London; P. E. Gloyd, Wandsworth, S.W.; H. H. Goodall, Nottingham; A. H. Goslett, Stanmore, Middlesex; W. C. Green, London; L. C. Gregory, Ravenscourt Park, W.; E. Harley, Camberwell Green, S.E.; S. G. Highmore, Poppleton; E. J. Hodgson, South Kensington, S.W.; C. E. W. Hope, West Norwood; J. D. Hunter, St. John's Park, N.; I. M. Kent, Norwich; F. A. King, Camden Town, N.W.;

A. V. Kislbury, Finchley, N.; W. G. Lawton, Salisbury; F. J. Lobley, Norwich; J. H. K. Loos, Sydenham, S.E.; W. Mackinnon, Gordonsquare, W.C.; A. J. Marsh, Sale, Cheshire; H. F. Mence, Camden-road, N.W.; A. T. Miller, Dover; R. T. Miller, Hercules-road, S.E.; J. Milne, Aberdeen; R. J. Mules, Mansfield; B. S. Murphy, Edinburgh; G. S. Nicol, Acocks Green, Birmingham; G. F. M. Ogilvy, B.A., Edinburgh; W. C. Oman, Tottenham, N.; T. Overbury, Cheltenham; H. J. Pearson, Brixton, S.W.; J. B. Penland-Smith, Edinburgh; A. R. P. Piercy, Stoke-on-Trent; J. M. Pirie, Aberdeen; W. O. Quayle, Ramsay, Isle of Man; H. R. Rainey, Burford, Oxon; T. H. Russell, St. John's Wood, N.W.; A. McIntosh, Ruthford, Aberdeen; E. D. M. Scrivener, Newcastle, Staffordshire; H. W. Sefton, Bolton; A. E. Senior, Newcastle-on-Tyne; J. Sidey, Montrose; G. Singers, Aberdeen; H. P. K. Skipton, Sutton; G. T. Smith, Aberdeen; J. Smith, Glasgow; W. R. Smith, Broughty Ferry; G. A. Soames, Blackheath, S.E.; R. G. Sparrow, Nottingham; W. B. Stonebridge, Oakley, Bedfordshire; F. Vause, Whitby; L. F. Ward, Birmingham; W. C. Watson, London; Daniel West, Southsea; H. M. Whiddington, London; V. Wilkins, London; A. Wingate, Glasgow; J. A. Woore, Derby.

The following gentlemen were also elected:—*Fellows*:—Harry William Roberts, Leicester; Charles Thomas Miles, Bournemouth; George Hubbard, 23, Finsbury Circus, E.C.; Herbert Osborn Cresswell, 30, Craven-street, Strand; Herbert Huntly-Gordon, 123, Cannon-street, E.C. *As Associates*:—F. W. Petter, Barnstable; C. K. Mayor, Manchester; C. A. Sharp, 15, Leadenhall-street; H. Story, Birkenhead; W. Hawke, Thornton Heath, Surrey; E. Greenop, P.A.S.I., 40, Chancery-lane, W.C.; F. E. Morris, Reading; P. Leeds, 21, Parliament-street, Westminster, S.W.; G. G. Irvine, 60, St. George's-road, S.W.; H. Hutt, Reading; H. G. Watkins, Lincoln; R. S. Besant, 26, Bedford-row, W.C.; A. J. Dunn, Edgbaston, Birmingham; J. A. E. Loft-house, Middlesbrough; G. Cowan, Portsmouth; G. J. T. Reavell, H.M. Office of Works, 15, Whitehall-place, S.W.; W. C. Waymouth, Great Trinity-lane, E.C.; C. M. Shiner, 2, Walbrook, E.C.; F. B. Dunkerley, Manchester; S. W. W. Delves, Tunbridge Wells; E. G. Collins, 6, Stratton-street, W.; E. Penfold, Reigate; O. Middleton, Cheltenham; R. Messenger, 7, Arundel-street, Strand, W.C.; J. H. Shaw, 22, Billiter-street, E.C. *As Hon. Fellows*:—E. Falkner, a Knight of the Dannebrog; an ancient member of the Academy of Bologna, and of the Archaeological Institutes of Rome and Berlin; Glanymor, St. Clears. Sir F. Leighton, Bart., President of the Royal Academy of Arts (Royal Gold Medalist 1894); Foreign Associate of the Institut de France, Member of the "Ordre pour le Mérite" of Frederick the Great; 2, Holland Park-road, W. *As Hon. Corresponding Members*:—Professor V. Schröter, Architecte de la Direction des Théâtres Impériaux, architecte en chef de l'Administration Générale des Appanages; Alexeïefskaja 2, St. Petersburg. H. J. Stübben, Kgl. Bau- und Beigeordneter der Stadt Köln; Sachsenring 82, Cologne. F. C. Heilmann, Stadtbaurath, Kgl. Bau-Inspector-a-D.; Victoriastrasse 5, Cologne.

Mr. G. A. Middleton then criticised some of the questions set on the Science side of the Intermediate and Final Examinations, and subsequently there was an exhibition of Herr Schröter's drawings, lent for the evening by Mr. E. O. Sachs.

The next meeting is on the 16th inst., when Dr. Max Ohnefalsch-Richter will read a paper on "Græco-Phœnician Architecture, with especial reference to the Origin and Development of the Ionic Volute."

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, at the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Loan for a Town Hall, &c.—On the recommendation of the Finance Committee loans were granted of 10,000*l.* to the Battersea Vestry for road improvements, and 25,000*l.* to the Hammersmith Vestry for a new Town Hall, &c. The works proposed to be executed in Battersea comprise the laying (in sixty-five roads and streets) of 6,247 yards of Sirlingshire granite channelling, 9 in. by 6 in. by 4 in., four courses in width, placed upon a bed of lime concrete 6 in. in thick-

ness; 7,982 yards of scorie block, 9 in. by 5 in. by 4 in., on a similar bed of concrete; and 19,944 feet run of granite kerbing, 12 in. by 8 in., at a total estimated cost of 10,207*l.* The Council's Engineer has examined a sample of the granite and scorie blocks proposed to be used, and as there is no experience of the wear of scorie blocks in London traffic, and as they look inferior to granite, he is of opinion that the repayment of the loan for these blocks should be restricted to ten years.

Land in Rosebery Avenue.—The Corporate Property Committee recommended the Council to authorize the expenditure of 450*l.* for alterations at 114, Farringdon-road, Rosebery-avenue. Mr. Taylor moved, as an amendment, seconded by Mr. Burns, M.P., that the specification and estimate should be referred to the Works Committee for the purpose of the Committee carrying out the work. The amendment was, on a division, carried by 52 votes against 48. The object of the proposed work is to give an impetus to the letting of several vacant plots of land in Rosebery-avenue.

Trinity Almshouses.—A special report was received from the same Committee in regard to the proposed demolition of Trinity Almshouses, Mile End-road. This stated that the buildings were of considerable architectural merit, and were additionally attractive by reason of their occupying two sides of a grass quadrangle. Various letters had been received asking the Council to do all in its power to prevent the destruction of the buildings, and, as the Committee believed it to be the general opinion that their demolition would be a Municipal misfortune, they recommended that the Council should express a strong hope that the Charity Commissioners would refuse their consent to the application of the Trinity Corporation.—This was agreed to without discussion.

Hydrants.—On the recommendation of the Fire Brigade Committee it was agreed that, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Lambeth Waterworks Company be requested to fix 337 hydrants, such hydrants to be obtained of Messrs. J. Blakeborough & Sons, in strict accordance with the sealed pattern deposited with the company, at a cost of 1*l.* 19s. 6d. each, including flange-piece and surface frame. The section to be dealt with comprises parts of Dulwich, Herne Hill, Norwood, and Sydenham, and contains an area of about 3½ square miles, of which, however, about 1½ square miles is not built over. The Committee were of opinion that in thoroughfares where the houses are set back at a considerable distance from the carriageway hydrants should be placed at from 250 ft. to 350 ft. apart, but that in thoroughfares in which the houses are smaller and nearer the footway the distance should be 450 ft. The pressure of water in the district having been taken in eleven places has been found to vary from 20 lbs. to 80 lbs. on the square inch, the average being 48 lbs. The cost of supplying and fixing the hydrants will probably be about 4,000*l.*

Proposed Palm-house for Battersea Park.—The Parks and Open Spaces Committee recommended that an expenditure of 2,000*l.* be authorised for the erection of a palm-house at Battersea Park, in accordance with the design prepared by the architect, and that inasmuch as the Chairman of the Works Committee was of opinion that the work was one which the Works Department was not in a position to execute with special advantage to the Council, the Committee be authorised to invite tenders. After a long discussion it was decided not to erect the building.

Photographs of Bridges.—On the recommendation of the Bridges Committee it was agreed that the Council's bridges be photographed for the purpose of protecting the Council's interests in the structures and their approaches. The work is to be entrusted to the Art Department of the Technical Education Board, at a cost of about 110*l.*

Result of Legal Proceedings.—High Buildings in Kensington Court.—The Building Act Committee reported as follows, the recommendation being agreed to:—

"In April, 1892, a building was erected without the Council's consent on the south side of Kensington Court, of greater height than the width of the street, in contravention of the provisions of Section 85 of the Metropolitan Management Act Amendment Act of 1862. Proceedings were taken by direction of the Council against the builder, and on November 14 following the magistrate before whom the case came dismissed the summons, with 10*l.* 10s. costs against the Council, holding

that, the main front of the house being in Kensington-road, the building was not erected on the side of Kensington Court within the meaning of that section. This decision was successfully appealed against, and the case remitted to the magistrate to adjudicate upon. On October 17, 1893, the builder's application for the Council's consent to the retention of the building was refused; and on the 24th of the same month the case came again before the magistrate, who stated that the High Court had held that the building had been illegally erected, and that he must impose a substantial fine, but was hard law, and that he wished the Council to understand that if proceedings were taken for continuing penalties he should consider that a very small fine should be imposed. In this case he imposed a penalty of 3*l.*, and ordered the defendant to pay 5*l.* costs. Proceedings for continuing penalties having been taken, the sitting magistrate has on more than one occasion acted upon the view expressed by the magistrate who heard the case in the first instance; and when the case was before the Court on August 25 last, a suggestion was made that some arrangement might be arrived at with a view to ending the matter. Upon this we instructed the solicitor to take out a further summons for continuing penalties in respect of fifty days, and to intimate that if the full penalty of 40s. per day were imposed the Council, whilst refusing its consent to the retention of the building, would take no further proceedings for penalties in respect thereof. This summons was heard by the magistrate at West London police-court on November 15th, when the defendant pleaded guilty, and the magistrate thereupon inflicted the full penalty of 40*l.*, and ordered the defendant to pay the cost of the summons. The arrangement arrived at, while not in all respects satisfactory, is the best that could be made in the circumstances, and ends litigation, which has been going on for more than three years. This was one of the cases referred to in the evidence given before the Select Committee when the London Building Act, 1894, was before Parliament, and it was no doubt helpful in obtaining the power given to the Council under that Act to take proceedings for the demolition of buildings erected without the Council's consent, of greater height than the width of the street in which they are situated or contravening the Act in any other respect. We recommend—that the course taken by the Building Act Committee with regard to the building in Kensington-court, erected without the Council's consent, of greater height than the width of the street, be approved.

East London Water Supply.—A discussion arose on the East London Waterworks (Height of Supply) Bill, which, as submitted by the Parliamentary Committee, proposes to place the company under obligation to supply up to the top level of the top story of the highest houses in their district. In the event of failure they would be liable to penalties of 200*l.* for the default, and 100*l.* a month for a default which continued as long as a month.

Mr. C. Harrison, M.P., moved to increase the penalty to 100*l.* a day, which was rejected, and the Bill was approved.

Workmen's Trains.—It was resolved that a communication be addressed to the Government pointing out the desirability of an inquiry being made upon the subject of workmen's trains and the operation of the Cheap Trains Act, 1883.

Work for the Unemployed.—Mr. Thompson moved:—

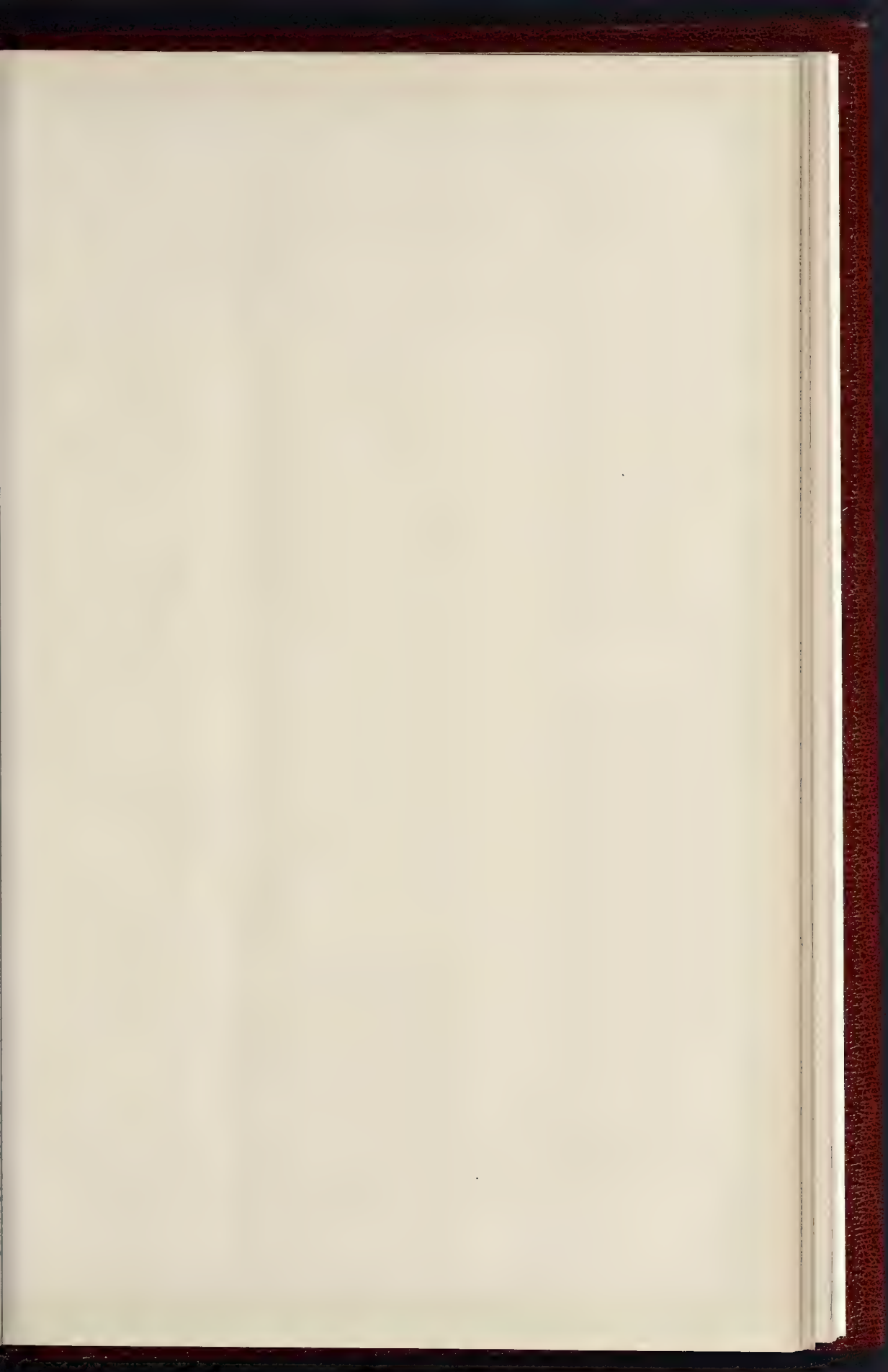
"That it be an instruction to all the spending Committees, in view of the growing evil of the want of employment among the working-classes during the winter months, and until the Government have found some permanent remedy to meet their occasions of exceptional distress, to proceed forthwith with all public work for which they have authorisation, and which may be legitimately carried out at this period of the year, having due regard to the interests of the ratepayers."

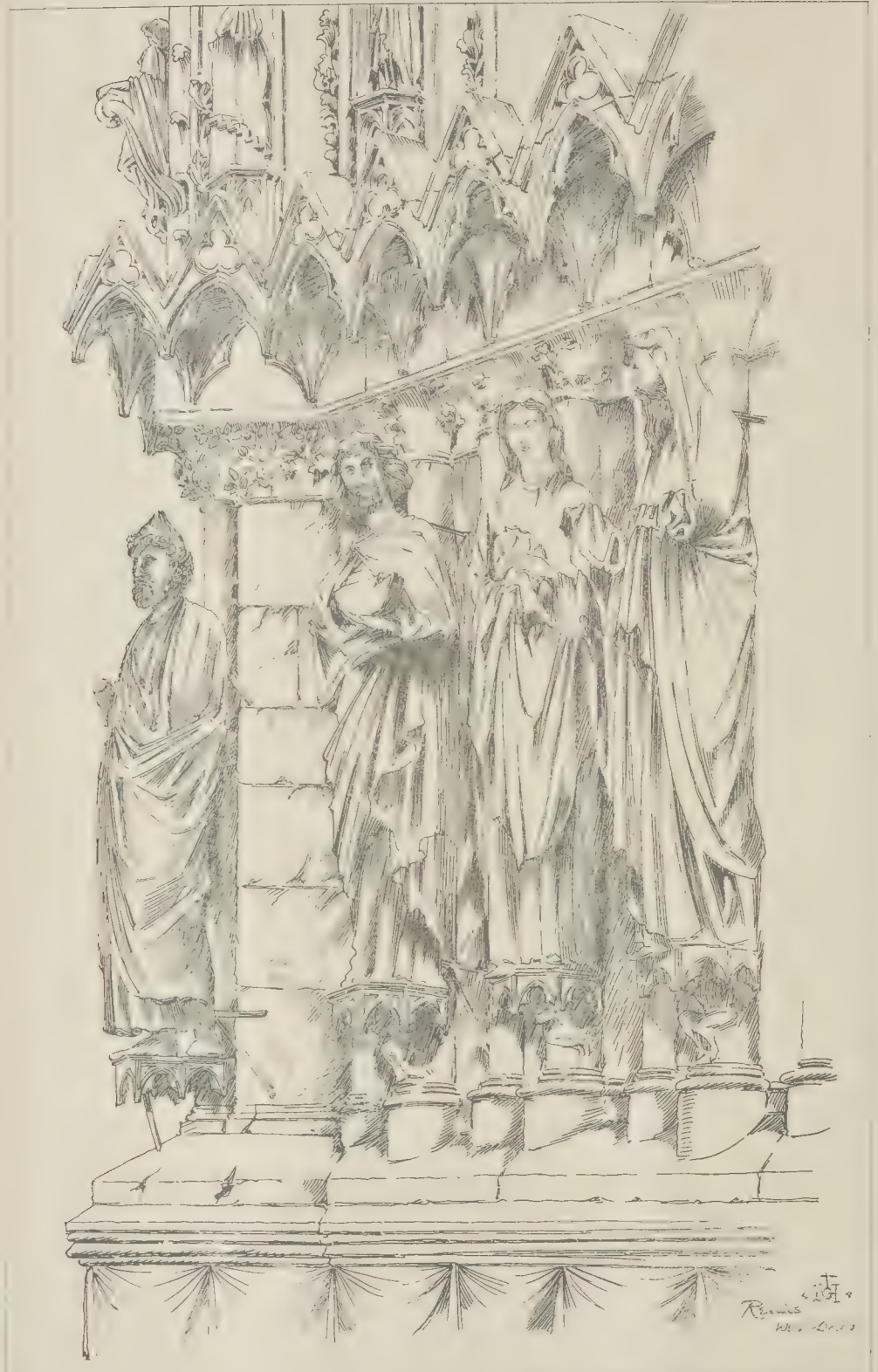
Mr. J. Burns, M.P., seconded the motion, stating that it was a plan which had been carried into effect automatically by the Committee of the Council for years past. The motion was agreed to, and the Council shortly afterwards adjourned.

COMPETITIONS.

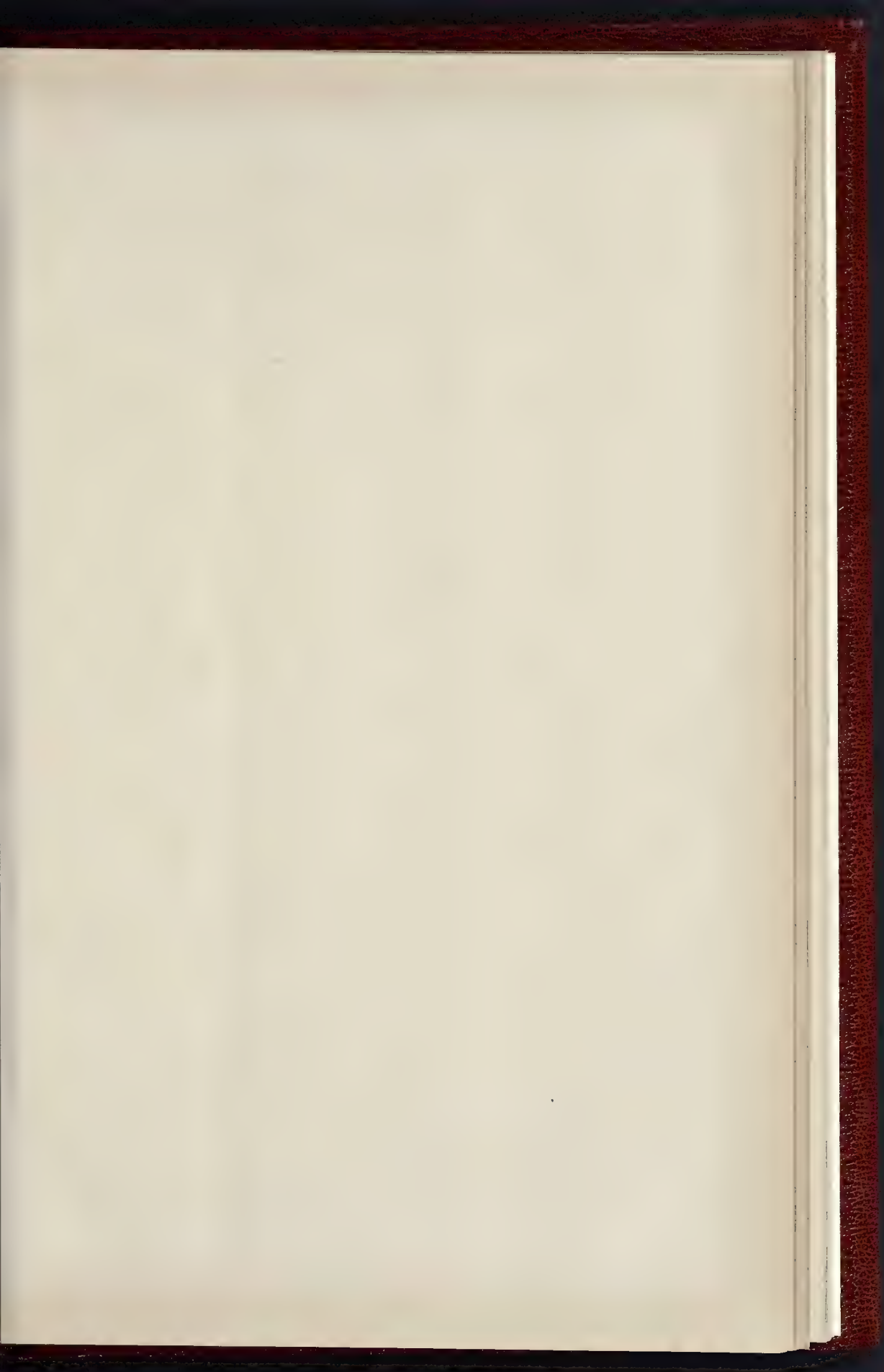
RECONSTRUCTION OF MUNICIPAL BUILDING ABERDEEN.—The Town Council has appointed Mr. William Young, architect, London, as professional assessor in this competition, his fee to be 100 guineas, besides travelling expenses. Mr. Young, it will be remembered, designed the Glasgow Municipal Buildings.

THE MRS. SIDDONS MEMORIAL.—The Committee have decided to entrust the execution of this work to Messrs. Farmer & Brindley. The sketch model selected by Sir Frederick Leighton, P.R.A., was made by their principal modeller, L. Chevalland, from a treatment suggested by Mr. Brindley; this same artist will produce the full-size model. The marble proposed to be used



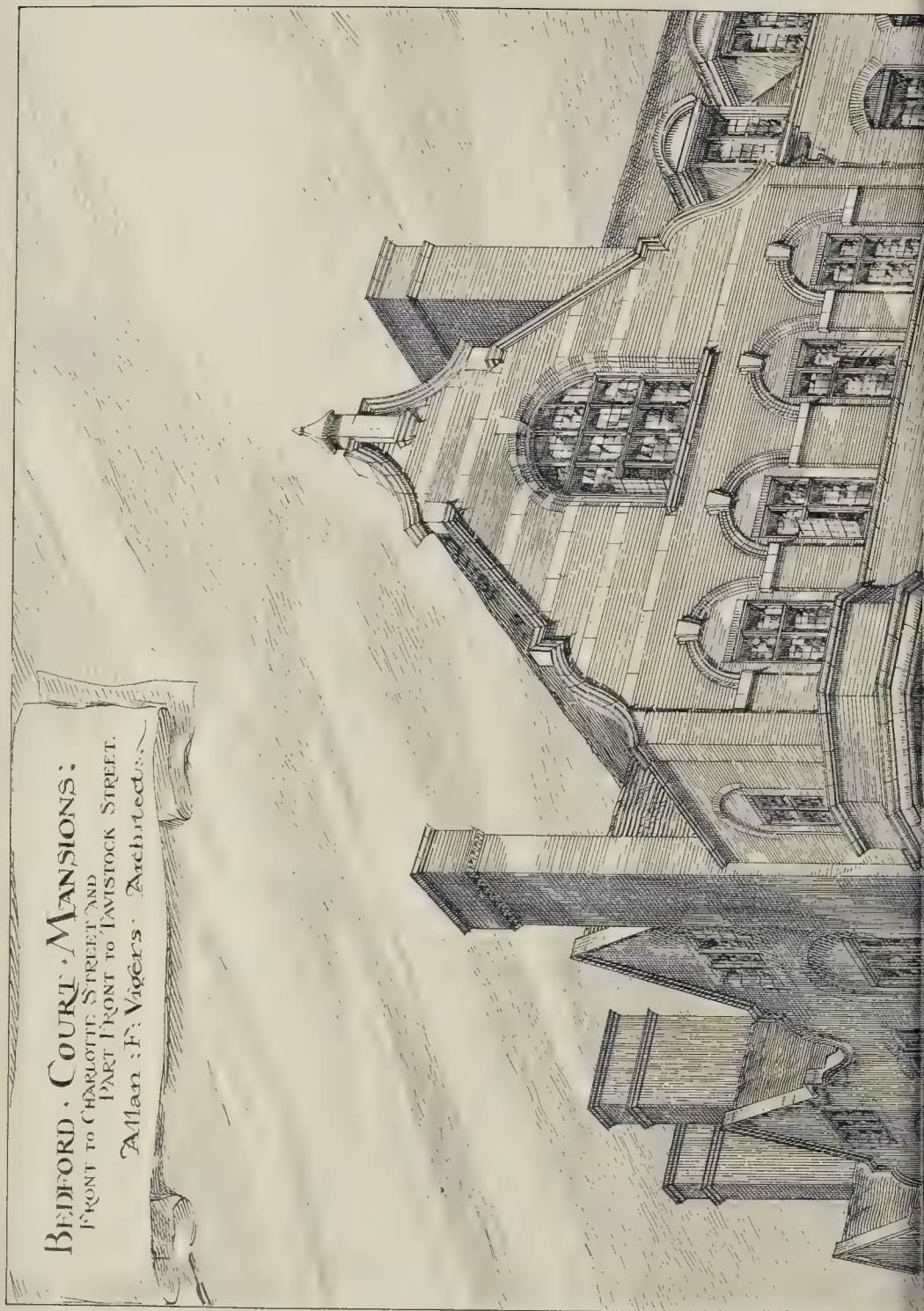


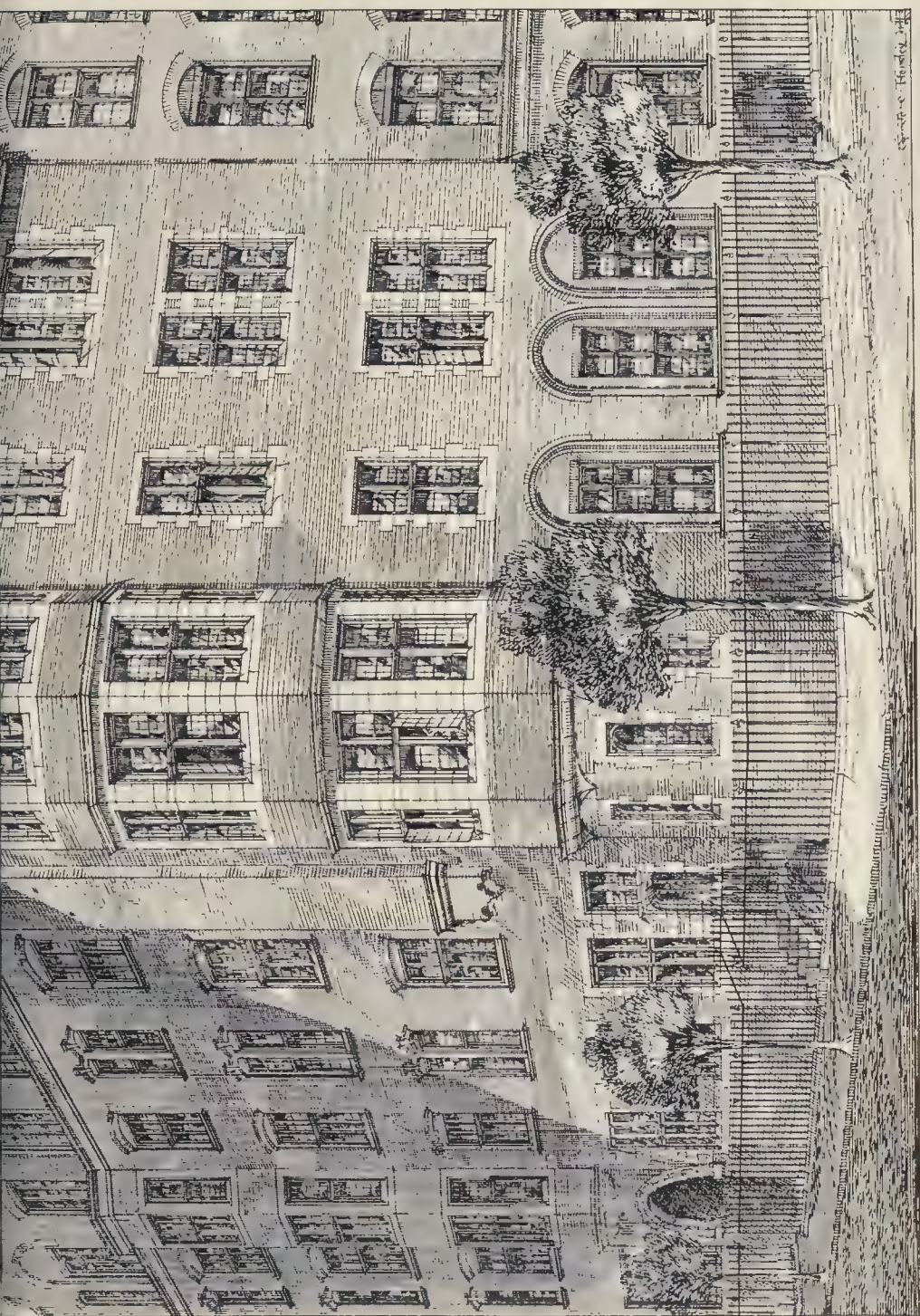




THE BUILDER. DECEMBER 7 1895

BEDFORD COURT MANSIONS:
FRONT TO CHARLOTTE STREET AND
PART FRONT TO TAVISTOCK STREET.
Allan F. Vigors, Architect.







STABLES :

: Craythwaite Hall

: Windermere :

MR Knill-Fresman F.R.I.B.A. Architect.

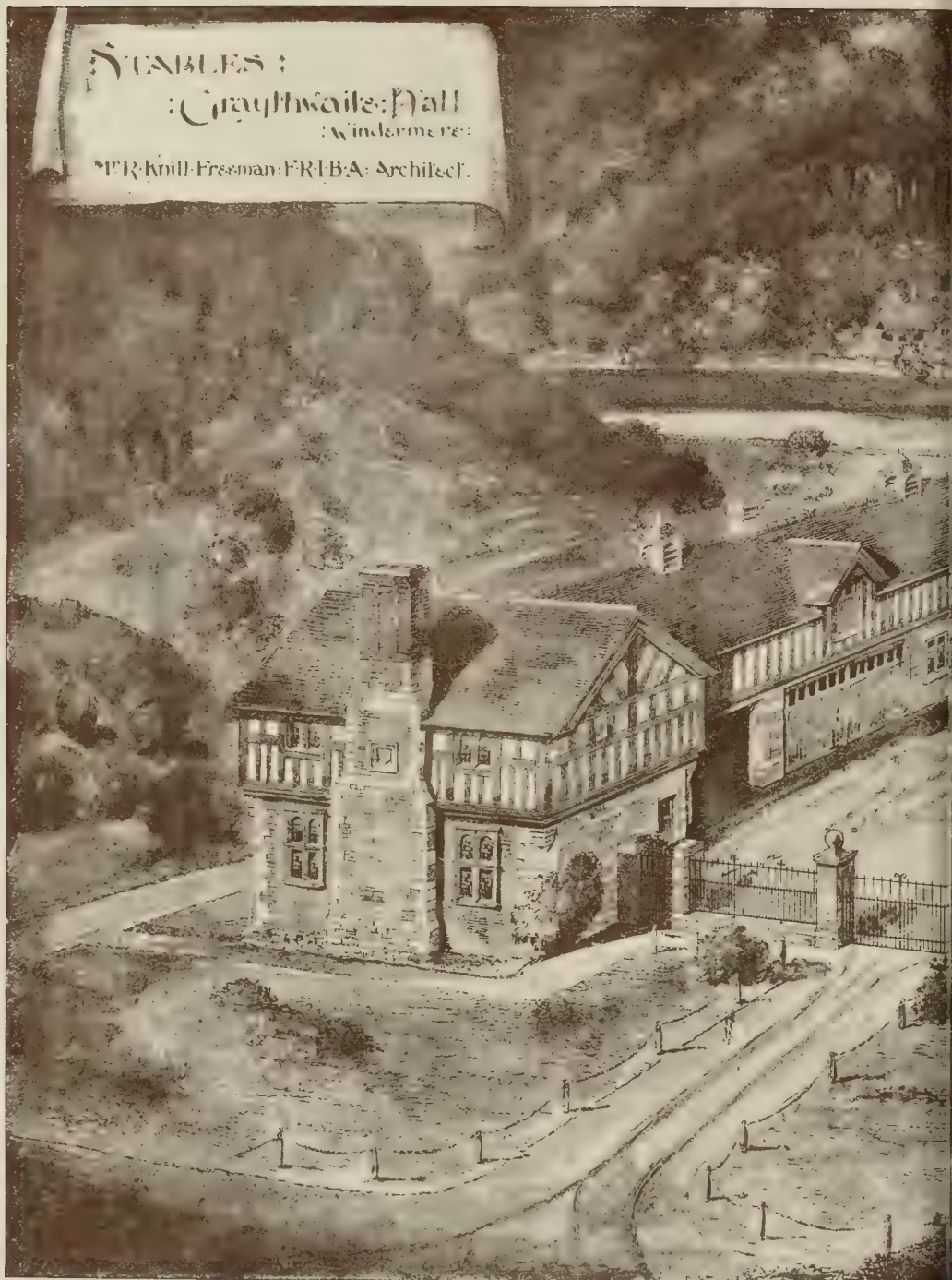


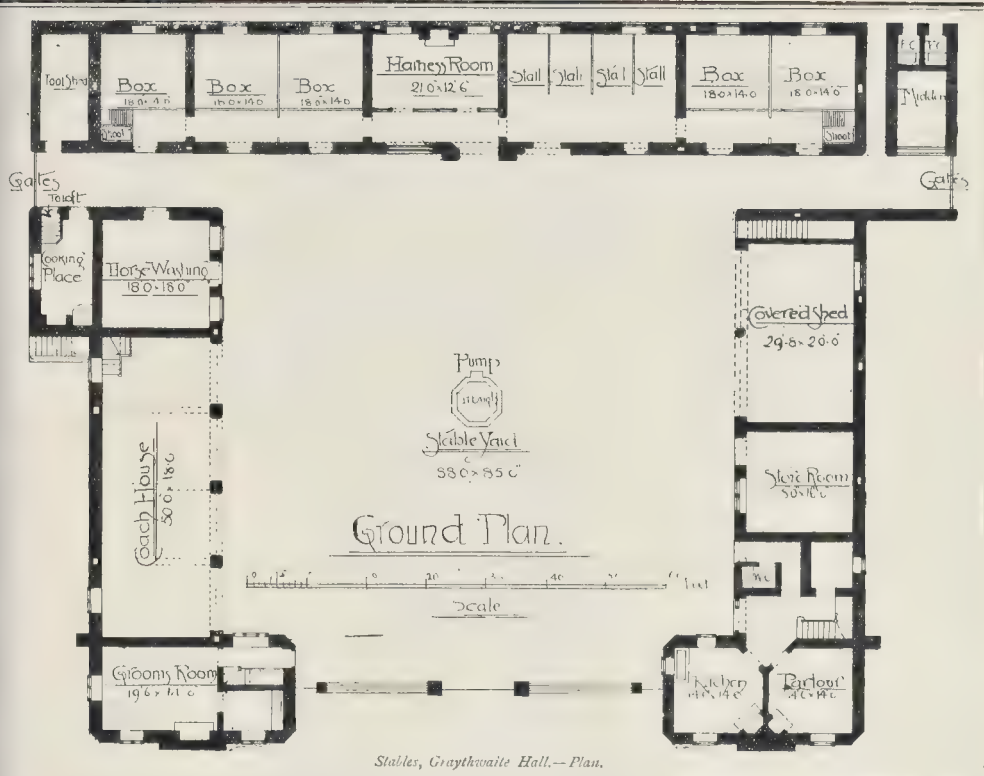








PHOTO. BY SPRACLE & CO. 423 EAST WARDING STREET, FETTER LANE E.



Stables, Graythwaite Hall.—Plan.

for the statue is the hard white of Mont Altissimo Serravezza, which up to now has not been used in England, nearly the entire produce having been reserved for Paris.

ROYAL INSURANCE COMPANY'S OFFICES, LIVERPOOL.—There is to be an important limited competition for designs for new offices for this company. Seven architects have been invited to compete, three in London—Mr. John Belcher, Mr. T. E. Colcutt, and Mr. E. W. Mountford; and four in Liverpool—Mr. J. Francis Doyle, Mr. Francis Holme, Mr. W. Aubrey Thomas, and Messrs. Woolfall & Eccles.

Illustrations.

PART OF WEST DOOR, REIMS.

THIS drawing, by Mr. G. C. Horsley, shows some of the statues in the west door at Reims Cathedral. They are remarkable both for the fine and broad treatment of the drapery, and for the individuality of style of the heads, which convey the impression of having been portraits from life.

BUTTRESSES, ST. ETIENNE LE VIEUX, CAEN.

THIS drawing, also by Mr. Horsley, interested us much on account of the striking and unusual treatment of the buttresses, which is most picturesque. In regard to the building itself, Mr. Horsley writes:

"St. Etienne le Vieux, Caen, is a desecrated church used in 1886 as a storehouse for portions of the old work removed from the Abbaye aux Dames, which was then being 'restored,' to make way for the new work inserted in its place. I regret to say that amongst these remains of old masonry I came across the carving from the tympanum of the west door of the Abbey, a most interesting representation of the Trinity, which was perfectly well preserved, with the exception of a few cracks, which might easily have been made good with a little mortar. The carving now in the tympanum is a copy of this old work, and the rejection of the old work and the insertion of a copy in its place is one illustration of the terrible practice of 'restoration' pursued by the French Government."

BEDFORD COURT MANSIONS.

THIS building, of which we give a perspective drawn by Mr. Gerald Horsley, is one of a series of four blocks of residential flats. This one faces Charlotte-street on one side and the extension of Tavistock-street on the other, and is situated at the back of the houses in Bedford-square on the south side; it consists of one large building divided into three parts, with separate entrances, staircases, and lifts, and has a large courtyard in the centre, approached by an arched carriage-way. There are also separate staircases for tradesmen.

The building contains forty flats of various sizes. It is constructed with brick and stone. The whole of the facing of the two elevations shown are built of red brick with Portland stone dressings.

Mr. Allan F. Vigers is the architect as far only as the exterior treatment is concerned, he having been working in conjunction with Messrs. Martin & Purchase, by whom the plan was made. Messrs. Colls & Sons are the contractors.

THE STABLES, GRAYTHWAITE HALL, NEAR WINDERMERE.

THESE stables, which have been recently erected for Lieutenant-Colonel T. Myles Sandys, M.P., are situated about half-way between the Ferry and Lake Side, and near the Hall. They form three sides of a square, and include coachman and grooms' houses, and other usual accommodation. The materials used are the local rough stone, with red stone dressings, the upper parts being in black and white timber framing. The roofs are of red Staffordshire tiles, and the chimneys of red brick.

The contractors have been:—For the excavating and masonry, Mr. G. H. Pattinson, Windermere; carpentry, joinery, and tiling, Messrs. G. Woods & Son, Bootle, Liverpool; plumbing, Mr. Graythwaite, Ulverston; stable fittings, Messrs. Musgrave, of Belfast. All the work has been carried out from the designs and

under the superintendence of the architect, Mr. R. Knill Freeman, F.R.I.B.A., of Bolton and Manchester.

The drawing from which the illustration is taken was exhibited in the Royal Academy of 1894, and included in the Builder "R.A. Album" for that year.

SMALL COUNTRY HOUSES.

OF these houses, No. 1 (the top in the left-hand corner) represents a detached house a short way out of London—the best out-look being towards the back, the principal rooms look in that direction. The upper floor contains seven bedrooms. It will be seen that the simplest treatment has been adopted, the building depending for interest on grouping and general proportion. The roofs are covered with local tiles, the lower story is faced with red bricks, and the upper rough cast. The total cost is about 1,500l.

No. 2 is a farm-house in Essex. The exterior is faced with red brick and tile-hanging, a small portion being half-timbered with oak and rough-cast filling. The cost is 1,800l.

No. 3 shows a small suburban house designed to be erected for the small sum of 1,150l. In this case all the joinery, &c., is of a very simple description, and the work throughout is of the most straightforward character.

The architect is Mr. T. W. Cutler, and the drawing was included in the last Royal Academy Exhibition.

NEW BY-LAWS AS TO SUBWAYS BY THE LONDON COUNTY COUNCIL.

THE following by-laws have been made by the London County Council under the provisions of the London County Council (Subways) Act, 1893, with respect to subways vested in the Council. The by-laws, as altered by the Board of Trade, were accepted at Tuesday's meeting of the Council. The by-laws do not apply to any pipe or wire authorised to be laid or placed by any provisional order or licence under the Electric Lighting Acts, 1882 and 1888, or under any special Act incorporating the said Acts or (in respect of such wires) to any company authorised to lay or place the same:

"1. Fourteen days at the least before the day

on which any company, body, or person desires to place or bring any pipe or wire (other than a service-pipe or wire) into a subway, such company, body, or person shall give notice in writing to the Council of such desire, accompanied by full particulars in writing of the position and manner in which such pipe or wire (other than a service-pipe or wire) is proposed to be brought into and placed in the subway, and of the dimensions and full particulars of any pipe or wire (other than a service-pipe or wire) that is proposed to be placed or brought into the subway; and also the proposed method of supporting the same, and, in the case of a wire, particulars of the insulation and highest electro-motive force for which it will be used. No company, body, or person shall place or bring any pipe or wire (other than a service-pipe or wire) into a subway, until the Council shall have signified its consent in writing under the hand of its engineer to the position and manner in which such pipe or wire (other than a service-pipe or wire) is to be placed, and to the method by which such pipe or wire (other than a service-pipe or wire) is to be brought into the subway. Provided always that this by-law shall not apply in case of emergency or in case of the necessity for repair of any pipe or wire, or the replacement of a single length of pipe. Should any emergency arise, particulars in writing of any work done shall be forthwith sent to the Council's engineer.

2. Three days at the least before the day on which any company, body, or person desires to place or bring any service-pipe or wire into a subway, such company, body, or person shall give notice in writing to the Council of such desire, accompanied by full particulars in writing of the position and manner in which such service-pipe or wire is proposed to be brought into and placed in the subway, and of the dimensions of such service-pipe or wire, and in the case of a service-pipe particulars of the insulation and highest electro-motive force for which it will be used. No company, body, or person shall place or bring any service-pipe or wire into a subway until the Council shall have signified its consent, in writing, under the hand of its engineer, to the position and manner in which such service-pipe or wire is to be placed, and to the method by which such service-pipe or wire is to be brought into the subway. Provided always that this by-law shall not apply in cases of emergency or in case of the necessity for the repair of any service-pipe or wire, or the replacement of any service-pipe or wire. Should any emergency arise, particulars in writing of any work done shall be forthwith sent to the Council's engineer.

3. Fourteen days at the least before the day on which any company, body, or person desires to take any pipe or wire out of a subway such company, body, or person shall give notice in writing to the Council of the manner in which such pipe or wire is proposed to be taken out of the subway. No company, body, or person shall take any pipe or wire out of the subway until the Council shall have signified its consent, in writing, under the hand of its engineer, to the manner in which such pipe or wire is to be taken out of the subway. Provided always that this by-law shall not apply in case of emergency or in case of the necessity for repair of any pipe or wire, or the replacement of a single length of pipe. Should any emergency arise, particulars in writing of any work done shall be forthwith sent to the Council's engineer.

4. A company, body, or person desiring to repair or alter any pipe or wire in the subway, or to replace a single length of pipe in a subway, shall (except in case of emergency) give three days' notice in writing to the Council of the nature of such repair, alteration, or replacement, and of the manner in which such repair or alteration or replacement is proposed to be made, and shall not commence such repair or alteration or replacement until after obtaining the consent in writing of the Council to the same under the hand of its engineer. Should any case of emergency arise, particulars in writing of any work done shall be forthwith sent to the Council's engineer.

5. Whenever a notice shall have been duly given in accordance with the foregoing by-laws, and the Council do not, before the expiration of such notice, approve, under the hand of its engineer, the proposals in such notice, subject to such amendments or conditions as may seem fit, or disapprove the same, and give notice of such approval or disapproval to the company, body, or person giving such notice, the Council shall be deemed to have given their consent to the proposals in such notice.

6. If, within fourteen days after particulars in writing of any work done in case of emergency shall have been received by the Council's engineer the Council shall, under the hand of its engineer,

disapprove of such work, the company, body, or person by whom such work was done shall forthwith alter or amend it to the satisfaction of the Council, to be signified in writing by the hand of its engineer.

7. No company, body, or person shall commence the execution of any work which will involve the alteration and reconstruction of any part of a subway until the expiration of forty-eight hours after such company, body, or person shall have given to the owner of every pipe or wire in the subway notice in writing specifying the nature of the work and the time at which it is to be commenced.

8. No company, body, or person shall take into a subway any candle, lamp, or light other than a safety lamp of a pattern approved by the Council, or smoke, or take, strike, or use therein any match, except with the consent of and under conditions approved by the inspecting officer of the Council appointed for the purpose.

9. No company, body, or person shall open or raise any grating or other means of access to a subway or enter therein (except in case of emergency) without the consent in writing of the Council under the hand of its engineer.

N.B.—The keys of the subway entrances will be kept at such places, and by such officials, as may from time to time be appointed by the Council for the purpose; each company, body, or person having pipes in a subway will be supplied by the Council with a card stating the places at which, and the names of the officials in whose custody the keys are kept, which card shall be produced to the officials whenever application is made for access to a subway; and such officials will arrange for the opening and closing when required of the gratings or covers for persons entering or leaving a subway.

10. No company, body, or person shall allow any grating or other means of access to a subway to be opened or to remain open without providing a temporary fence or protection and leaving a watchman to guard the same.

11. No company, body, or person shall (except in cases of emergency) enter or remain in a subway between the hours of 6 p.m. and 6 a.m.

12. Every company, body, or person having a pipe or wire in a subway shall, within six months of the confirmation of these by-laws, deposit with the Council full particulars in writing of such pipe or wire, stating name of subway; date when first placed; position, dimensions, gauge, material, and purpose for which it is used or proposed to be used; nature of supports (if any); and within a further period of six months, if so required by the engineer of the Council, shall deposit with the Council a plan, on a scale of not less than 8 ft. to one inch, showing the position, with such detail drawings as the Council may require.

13. Every company, body, or person depositing the particulars and plan required by the last preceding by-law shall, once in every subsequent year, cause such particulars and plan to be duly corrected to date.

14. No company, body, or person shall store materials in a subway, or allow any rubbish to accumulate or remain therein.

15. No person shall commit any nuisance in a subway.

16. All persons working or being in a subway shall conform to all reasonable requirements of the Council's officers.

17. Every company, body, or person using a subway shall pay to the Council, on the usual quarter days in each year, fees and charges according to the following scale:—

(a) A charge of 5s. for each day or part of a day during which a pipe or wire is being repaired, or altered, or laid in or removed from a subway.

(b) A charge of 1s. for opening or closing a subway at any time other than that fixed for the daily visit of the Council's officers.

(c) An annual charge for use and supervision.

18. Any company, body, or person failing to comply with, or doing anything prohibited by, any of these by-laws, or any of the provisions of the London County Council (Subways) Act, 1893, or delivering to the Council any particulars or plans, or making any corrections therein, which to their or his knowledge are incorrect, shall be guilty of an offence against these by-laws, and shall be liable to a penalty not exceeding five pounds, and to a further penalty not exceeding forty shillings for each day during which such offence is continued after written notice of the offence shall have been given."

THE TRINITY ALMSHOUSES, MILE END.

We give a sketch of this interesting building, the proposed demolition of which by its owners has excited so much public feeling. The view is taken from the street, so as to show the street facade with its curious in-and-out treatment, and the leaden models of ships on the cornice. An account of the building will be found in "Note" in our issue of November 23, page 374.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—The fourth general meeting of the current session of this Association was held on the 29th ult. at the Exchange Buildings, New-street, the headquarters of the Association. Mr. William Henman presided. Mr. C. Nicol was elected a member of the Association, and Mr. Herbert Martin and Mr. J. E. Blaine were nominated, the first as a member, and the latter as an associate. The Chairman then called upon Mr. Horace Appelbee to read his paper entitled "The Conduct of Architectural Competitions." Mr. Appelbee in the course of his paper said that in his view many competitors of late had not received the consideration they were entitled to, as competitions cost them as a body much more than the successful man would receive in commission for erecting the building. In order that a competition might be satisfactory to every one concerned it would be necessary in his opinion (1) For the accommodation required to be very definitely scheduled. (2) That no unnecessary restrictions should be made as to where that accommodation should be placed. (3) If any restrictions had to be inserted, such as limit to cost, or frontage lines, they should be most strictly adhered to in making the award. (4) And most important of all, that the means adopted for making the selection should be such that both promoters and competitors shall be convinced of its justice, and therefore willing to abide by it, and that the promoters see that it is not to their interest to go contrary to it. To obtain this end a committee or jury was suggested, and its constitution and advantages over the single assessor discussed. (5) For the remuneration offered both for the competition drawing and services rendered if the buildings were erected to be such as architects usually receive. And lastly, to obtain more publicity towards the close with a view to preventing bogus competitions. Mr. Appelbee illustrated these points by some recent examples.

ARCHITECTURAL SECTION, GLASGOW PHILOSOPHICAL SOCIETY.—The fortnightly meeting of this section of the Glasgow Philosophical Society was held in the rooms, 207, Bath-street, on the 2nd inst. Mr. T. L. Watson, the President, in the chair. A paper was read by Mr. James H. Craigie, the Alexander Thomson travelling student of 1893, entitled "My Student Tour." The paper was a brief description of the tour made in fulfilment of the conditions attached to the studentship, and during the course of it reference was made to the Trocadero in Paris as an important factor in architectural education. "The feature of this grand institution," said the lecturer, "is the magnificent collection of architectural casts, some of giant proportions, which illustrate almost every phase of French architecture. This attempt to portray the country's architectural history is a most commendable one, and one which our own country might follow with advantage to her architectural students. In South Kensington the casts are more of foreign than of native work, and while these have their own value they do not appeal so strongly to the Briton as a representative collection of good British work would, especially when placed in chronological order." The lecturer paid a tribute to the Italian Government for placing at the disposal of any art student, free of charge, all Government galleries, museums, and monuments in the kingdom on his submitting a request to that effect, backed up by either the local Consul's recommendation, a passport, or the Royal Institute of British Architects' travelling-card. Referring to the Vatican, he mentioned the disadvantage British art students are at when they wish to study in any of the places dominated by His Holiness owing to there being no British Ambassador to the Papal Court to give weight to their petition. The petty officialdom which hedges His Holiness also suffers in contrast to Government officials, who are politeness personified. The tour embraced almost all the principal towns of architectural interest in Italy, and occupied six months. The paper was illustrated with a number of limelight views and drawings. At the close a hearty vote of thanks was accorded Mr. Craigie for his paper.



View of the Trinity Almshouse, Mile End-1922.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The opening meeting of the Session of the Edinburgh Architectural Association was held on the 27th ult., in the National Galleries on the Mound—Dr. Rowand Anderson, the President, in the chair. The President delivered his inaugural address, part of which we print on another page. Professor Baldwin Brown afterwards submitted and explained a series of limelight views of "The Frescoes by Michelangelo, in the Sistine Chapel at Rome." He explained not only the general features of the decorative scheme of the frescoes, but, treating their subjects in detail, pointed out their great interest and value as works. When, he said in effect, all the facts were kept in view, these frescoes were to be regarded as one of the greatest works of genius the world had seen. On the motion of Sir Henry Littlejohn, Professor Baldwin Brown and the President were cordially thanked. Before the assemblage dispersed they had an opportunity, through the kindness of Mr. James Auldjo Jamieson, W.S., of inspecting a collection of old engravings lately found in an attic room in the Duke of Hamilton's apartments in Holyrood Palace.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—At the ordinary monthly meeting of this Association on Tuesday, Mr. Wm. Tait Conner, Vice-President, in the chair, a paper was read by Mr. Alex. McKee on "Acoustics." The paper first treated of sound and echo, and showed how they were carried. Sound could be reinforced by having air space in walls, ceiling, or floor, also by using wood, glass, or concrete, although plaster was not considered of any help. The Banqueting Hall of the Municipal Buildings was spoken of, the reason of the defect being considered due to the shape of the ceiling, whereas the St. Andrew's Hall, acoustically, was considered very good, the proportion being three width to two height. Good ventilation was an absolute necessity for good hearing; strong air currents should be avoided, as the sound was apt to be diverted. A discussion was opened by Mr. Wm. Fraser, and the usual vote of thanks was passed. An interesting exhibition of cartoons and mosaic work, shown and executed by Mr. Mecenero, London, for the Greek Church, Bayswater, was exhibited in the hall, also about 200 Italian photographs, lent by Mr. Morris, architect, Ayr. The exhibition will be on view for a fortnight.

OLD FIREPLACE, GUILDFORD.

The fireplace of which an elevation, section, and details are shown in the two annexed engravings, is in the dining-room of the Abbots Hospital, Guildford. The carving of the top panels is in very low relief.

The chair which is introduced in the lower portion of the right-hand drawing, by way of turning the rest of the space to account, is a characteristic and interesting example from among the old chairs some of which are still in use at Hampton Court Palace.

Correspondence.

To the Editor of THE BUILDER.

THE LONDON COUNTY COUNCIL ON SOIL-PIPE TRAPPING.

SIR,—I understand that the London County Council has just passed the following by-law:—"He shall so construct such soil-pipe, . . . that there shall not be any trap in such soil-pipe, or between the soil-pipe and any drain with which it is connected."

Now, if this means that when there is no other special and proper provision made for the ventilation of the drain, then the soil-pipe is to be used for that purpose, such is all right; but in cases where a special ventilating blow-off pipe—say a strong 4-in. iron or lead and iron pipe—is put up to ventilate the drain, why prevent the soil-pipe being disconnected or trapped off from the drain?

In a building with several soil-pipes in it, why should all these soil-pipes be ordered to be in full aerial communication with each other, and with the same drain, if the proprietor is willing to go to the extra expense of putting in a special blow-off pipe for the drain, and a disconnecting ventilating-trap for each soil-pipe, with a side fresh-air inlet in a safe position?

Isolation, we are authoritatively told, is one of the best protectives against infection; why, therefore, not carry it out, as far as possible, in our houses as well as in our hospitals?

There is a proverb to the effect that "In a multitude of counsellors there is much wisdom." The experience of the working of this has, however,

evolved another proverb, which says that "Too many cooks spoil the broth."

If it is to be the rule that in no building where the London County Council has supervision any soil-pipe can be disconnected from the drain it delivers into, then, in many cases, the pseudo-sanitarians so ruling would be anything but good sanitary cooks.

W. P. BUCHAN.

* * The By-law referred to is not as recent as Mr. Buchan supposes. It was passed by the London County Council and allowed by the Local Government Board in June 1893. It appears to us to be a very doubtful measure, and that the County Council has unnecessarily taken on itself to legalise and to demand a principle of construction in regard to which sanitary experts are still much divided in opinion, and the desirability of which is seriously open to question.—ED.

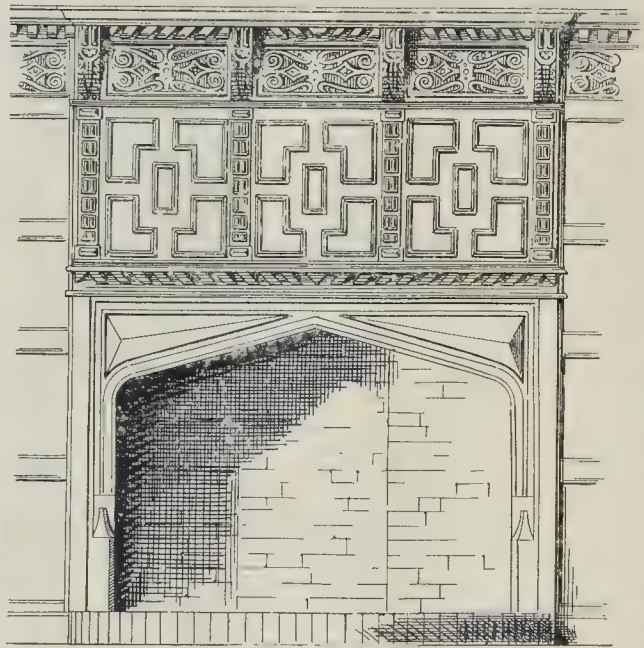
THE TRINITY CORPORATION OF DEPTFORD-I.E-STROUD.

SIR,—The demolition of the beautiful almshouses in the Mile End-road would be a fit sequence to a similar act of vandalism perpetrated by this ancient Corporation at their headquarters less than a quarter of a century back, for which that economic reformer, the late Joseph Hume, was credited as the pioneer.

What have we at Deptford in exchange for equally interesting memorials of the beneficent intentions of our forefathers, but the most squalid and neglected area of the most depressing portion of this ancient and once important town and naval depot, wide streets, compelled so to be by statute, named (ironically?) after "Berthon" and other well-known officials of this venerable Brotherhood; lined by two-storied cottages the very acme of jerry building; which, after an existence of some fifteen years, are now in a state of collapse and premature decay, the back additions parting company with the main buildings, window-arches falling out, and the "mud-mortar," innocent of silica, in the same state as when plastered into the joints by the precious bricklayers of modern times, and which is easily even now removable with a pen-knife from the joints. The basements, founded on the bastard clay overlying the gravel substratum, down to which the 14-in. walls of their worthy predecessors were carried in the olden days, show by their rotten floors and humid walls the insanitary condition of these successors to the early solidly-built structures erected for charitable purposes.

The Trinity Corporation, as the freeholders, presumably enjoy the ground-rents of these delectable residences,

J. B. REDMAN.



Old Fireplace, Guildford.

SHOREDITCH FREE LIBRARY AND BATHS COMPETITION.

SIR,—The result of this competition, which has just been announced, appears to be very unsatisfactory.

In the conditions it was distinctly stated that three premiums would be given for the library and three for the baths, yet the assessor gives the six premiums to three competitors.

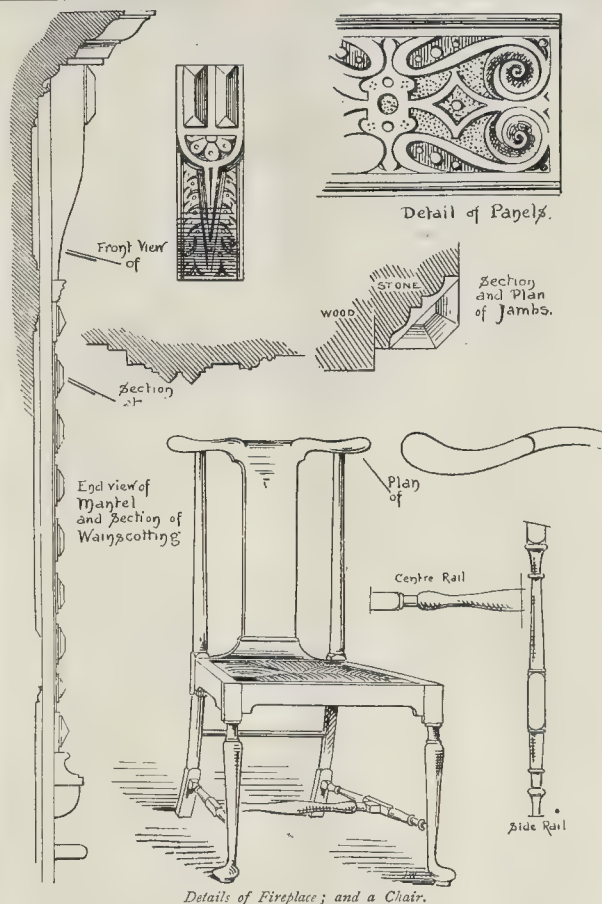
One could understand the first premium in each case being awarded to the same competitor, for obvious reasons; but it seems incomprehensible that out of thirty-five competitors, some of whom are well-known and successful architects, there should not have been others who are entitled to a share in the four premiums given to the competitors placed second and third.

"DUBIOUS."

The Student's Column.

METALS USED IN BUILDING.—XXIII. STRENGTH.

THE strength of metals used in construction is a very unsatisfactory subject to deal with on account of the absolute impossibility of arriving at data other than of the most approximate character. So much depends in the first place on the purity of the ores, their preparation, smelting, and subsequent manufacture, that in quoting strength one ought always to refer to the general character of the metals. It is true that for commercial purposes a certain classification is adopted, and that in a general way a designation based accordingly imparts a fair idea of the broad characteristics of the substance, and that the strength of the substance may therefore be quoted as referring to something of a specific nature, but that is liable to be seriously misunderstood in very many instances. It is of no use to say that the strength of a lead pipe of a certain thickness and diameter is so and so, and cast-iron is so and so. We must know more respecting the composition of the lead and cast-iron, and, further, the results obtained should be comparative. Average strength is interesting from a general standpoint, as imparting an idea of the quality of strength of one metal as compared with another, but averages should not be permitted to rank very



Details of Fireplace; and a Chair.

high for working purposes. It must be borne in mind that the strength of a column or girder is only that of the weaker parts, and that, in most cases of failure, carelessness of manufacture has been found to be mainly responsible.

The strength of several metals used in construction is liable to vary after the structure has been erected, and especially if machinery in motion, with consequent vibration, is to be employed therein. The whole structure of the metal in certain situations in such a building is liable to molecular change, and the metal deteriorates accordingly. The strength of a girder is frequently much less after it has been placed in position a few years, and that through no cause resulting from atmospheric decay. The latter, naturally, affects strength, but due warning is given long prior to collapse. Homogeneity of composition is perhaps the best safeguard against atmospheric influences; where, as in steel, graphitic flakes are liable to occur in patches and "strings," local decomposition sets up in such places, and weakening results. From the foregoing observations it will be gathered that frequent tests on girders and columns used in building and engineering work are indispensable, though even that cannot ensure freedom from collapse under special circumstances.

We need not discuss the various means and appliances adopted in testing the strength of metals; the student who desires information on that head could not do better than consult Professor Unwin's "Testing of Materials of Construction," published in 1888, together with recent volumes of "Minutes of Proceedings of the Institution of Civil Engineers."

Speaking generally in regard to cast-iron, the carbon present is usually credited with modifying the physical attributes of the metal; the greyer kinds of iron contain most graphitic scales and are weaker, more fusible and softer than whiter

iron which contains most combined carbon. Ferro-silicon (a cast-iron with about 10 per cent. of silicon) is mixed with other cast-iron to render it stronger and more useful for foundry purposes. Professor Unwin states (*Op. cit.*, p. 262), that the softest iron used in the foundry has about 15 per cent. of combined carbon. With 1 per cent. the transverse strength is greatest; with more, the crushing strength increases, but the tenacity and transverse strength diminish. The amount of graphitic carbon has less influence. The silicon, when it does not exceed 3½ per cent., appears to be advantageous in securing a soft, grey, strong iron. Re-melting cast-iron improves its strength, but, if repeated too long, the tensile and transverse strength suffer, though the crushing strength and hardness increase. Mr. Turner from an examination of all existing data made an attempt (*cf.* "Trans. Iron and Steel Inst., 1885") to determine the best composition of cast-iron to obtain certain definite qualities, from which Professor Unwin has compiled the following table:—

	Combined Carbon.	Graphitic Carbon.	Silicon.
Greatest softness.....	15	31	25
" hardness.....	—	—	under 8
" general strength.....	50	28	140
" stiffness.....	—	—	10
" tensile strength.....	—	—	18
" crushing strength.....	over 10	under 26	about 8

Experiments have been made to demonstrate that in small castings the strength varies materially with the size, the smaller castings being the stronger. Hodgkinson found that bars of cruciform section were about 1 per cent. stronger than bars with circular or rectangular sections of the same area. The tensile strength of cast-iron bars varies from about 4 tons per square inch to 20½

tons; and the "means" of a very large number of tests varied from 6·8 to 15·3 tons per square inch.

In arriving at the crushing strength of cast-iron the results are not strictly comparative unless pieces of the same shape are used. The crushing resistance is much increased if the height of the piece tested is so decreased that the plane of least resistance to shear cuts the faces at which the pressure is applied. The lowest recorded result of the crushing strength of cast-iron (cylinders) is 19·8 tons per square inch, and the highest obtained after repeated re-meltings—95·9 tons. The shearing strength of cast-iron varies from 3·92 to 5·29 tons per square inch.

In Bessemer steel the strength is increased and the extension diminished by an increase in the percentage of carbon until it reaches 1·2 per cent., when the strength is about 60 tons per square inch. Styffe* gives the following table:—

Table showing the Effect of Carbon on the Strength of Steel.

Material.	Mark.	Percentage of Carbon.	Breaking strength in tons per square inch.
Puddled steel.....	NP. 1	0·8	49·9
" " " "	B. 1	0·8	47·5
" " " "	NP. 2	0·7	37·6
" " " "	NH. 1	0·7	37·3
" " " "	NH. 2	0·7	37·4
" " " "	G. 1	0·7	35·0
" " " "	P. 1	0·6	32·6
" " " "	P. 2	0·6	30·7
" " " "	B. 2	0·55	30·8
" " " "	B. 3	0·5	31·7
" " " "	G. 2	0·5	35·0
Iron.....	B Iron	0·2	21·5

Bauschinger found that for tension, plates of steel 24 in. in length, 2·8 in. in width, and 0·48 in. thick, varied in strength from 28·1 to 52·7 tons per square inch. The lowest result was obtained with the carbon percentage at 1·4 and the highest with 0·6.

The tensile strength of wrought-iron is increased by repeated piling and rolling, but, according to some authorities, this can be continued too long. Thus, in one series of experiments quoted by Professor Unwin, the tenacity of the iron in its original state was 19·6 tons per square inch, which increased to 27·5 at the sixth working, and then decreased to 19·6 tons per square inch at the twelfth working.

If the value of a material for constructive purposes be determined by its tensile strength and ductility, then manganese steel should rank highly in that respect. In a series of tests described by Mr. R. A. Hadfield,† a peculiar combination of high tensile strength is exhibited, sixty to seventy tons per square inch giving higher elongation than had hitherto been recorded of any material. Notwithstanding this, in most cases the halves of the test-bar were afterwards bent double when cold. Results obtained on that metal by Mr. J. F. Barnaby are given in an appendix to Mr. Hadfield's paper quoted. The effects of torsion may be given as follows:—

Torsion Tests of Manganese Steel Wire.

72 complete twists on length of 14 in., before fracture occurred.

68	"	"	"	14 in.,
46	"	"	"	8 in., not broken.
42	"	"	"	8 in., broken.
115	"	"	"	8 in., broken.

One-half of the wire was water-quenched, and notwithstanding the severe punishment already borne, was then bent double, cold.

In this connexion, it may be stated that hard-drawn Bessemer wire gives about four twists on 8 in. before breaking, and in its soft state about forty twists; but in the latter state its tensile strength is only about 30 tons against 70 tons per square inch of manganese steel. The best crucible-steel wire gives from twenty-five to thirty-five twists, and when hardened, a tensile strength of 60 up to 150 tons, according to the purpose for which it is required.

Many experiments have been made as to the effect of stress repeatedly applied both to manganese and ordinary steel. The water-quenching process in manganese steel produces a similar effect (though in a more marked degree) to that of annealing ordinary steel. Manganese steel elongates almost uniformly throughout the whole length under stress; in ordinary steel the greater part of the contraction of area generally takes place in the centre of the piece being tested,

* "Iron and Steel," p. 46.

† "Min. Proc. Inst. C.E.," Vol. xciii. (1888), p. 20, et seq.

and in all cases it centralises itself at one particular point, assuming a pear shape, instead of stretching uniformly throughout its length.

OBITUARY.

HERR PRYLINSKI.—We regret to record the death of the Polish architect, Prylinski, who was a prominent member of the profession and an authority on Polish archaeology. Among his works we would notice the restoration of the old "Lukieniec," or cloth-market, at Cracow, and his designs for the restoration of Wanel Castle. This design was, however, carried out by another architect, the author receiving a commission of 2,000*l.* The deceased architect, with Messrs. Fellner & Helmer, obtained a first premium in the Craoow Theatre competition. He was fifty-three at the time of his death, and was a pupil of Van-der-Null, of Vienna, and Viollet-le-Duc, of Paris.

MR. THOMAS CUNDY.—The late Mr. Thomas Cundy, who recently died at Brighton, aged seventy-five, was buried at Brompton Cemetery on November 9 last. He was educated at Oxford, and after studying abroad he entered his father's office, who was then surveyor to the estates of the Duke of Westminster in London. He afterwards started in practice on his own account, and shortly afterwards he gained the first prize in a limited competition for the rebuilding of Upper and Lower Grosvenor-gardens and Grosvenor House. After the death of his father he succeeded him as architect and surveyor to the Westminster estates, which position he resigned in 1890. Mr. Cundy was for some years surveyor to the Marquis of Northampton, and also to the estates of Messrs. Broadwood and the Commercial Bank; and, independently of his architectural work, he was largely employed in arbitrations, reports, and valuations. Some of the principal works carried out by Mr. Cundy were—St. Vincent's, St. Michael's, and the Grosvenor-road Churches, Piccadilly; St. Michael's, St. Peter's, and Ebury-square Schools; the Belgrave Mansions, and all the new houses in Upper and Lower Grosvenor-gardens, Grosvenor-place, Grosvenor-crescent, and Wilton-place; most of the new houses in Grosvenor-square, and various blocks of buildings in Oxford-street and on other parts of the Grosvenor and the Piccadilly estates. Mr. Cundy was also architect for a large number of houses in and about Kensington, and for Park-place, Henley-on-Thames, and at Taplow, and at Farringdon; Busset Park in Berkshire, and extensive alterations at the Marquess of Conyngham's town-house. He was also a member of the Merchant Taylors, and Master of the Company. Mr. Cundy was a most painstaking, hard-working man, and no detail was too small for his most careful consideration.

GENERAL BUILDING NEWS.

CATHOLIC CHURCH, NORTHAMPTON.—A new Catholic Church is being erected in the Park-road, Northampton. Mr. Leonard Stokes, of Westminster, is the architect, and Mr. Hammond, of Peterborough, the builder.

ADDITIONS, ST. MARK'S CHURCH, REIGATE.—The additions that have been made to this church were dedicated on the 29th ult. The now completed works have been carried out from the designs and under the personal superintendence of Mr. Charles R. Baker-King, of Spring Gardens, S.W. Messrs. Nightingale Bros., of Reigate, have been the general contractors. A reredos in polished alabaster and carved oak memorial pulpit have been placed in the church. They have both been carried out to the architect's design by Messrs. Harry Hems & Sons, of Exeter, who have made the new chancel-screen as well as the credence table and adjacent double sedilia, all of which are in Bath stone. The altar-table is of English oak. The new pulpit occupies the same site as did the former one, and is six-sided. Its panels have sculptured representations of different scenes in the life of St. Mark, the patron saint, and the reredos has three white marble panels, in which are groups carved in high relief, and representing in the centre the Resurrection.

NEW CHURCH, PLUMSTEAD.—On the 30th ult., the Duchess of Albany laid the foundation-stone of a new church to be dedicated to St. Mark, at Plumstead. The building has been designed by Mr. Richard J. Lovel, of Queen Victoria-street, E.C. There is a large hall on the ground floor capable of seating about six hundred people, besides classrooms, retiring-rooms, and kitchen. The church, which is on the first floor, is approached by two flights of wide outside steps from a loggia. The exterior will be built of red brick and Portland stone.

DISTRICT COUNCIL OFFICES, BARNES.—The Barnes District Council are now occupying their new offices, which are situated at the east end of High-street, Mortlake, on a site of one and a-half acres, bounded on the north by the River Thames, and on the south by the High-street. The building (originally known as "The Limes"), is a structure of three stories, entered through a portico carried on columns, and the alterations necessary to adapt it to the purposes of Council offices having been completed, it contains on the first floor a Council chamber 37 ft. long by 28 ft. wide, a committee-room,

14 ft. by 15 ft., with cloak-room and lavatory, and the public and private offices of the clerk to the Council. The ground floor is occupied by the surveyor's private office, drawing office, Inspector of Nuisance's office, and a strong room, having fire-proof floor and ceiling. The basement will be used for store-rooms, and the top-floor contains the caretaker's apartments, cistern-room, and the ladies' cloak-room. The staircase, which is in two flights, is lighted at the landing by a large circular-headed window, the window-recess being occupied by a statue. The new fire-station is to be situated on the same site, some 60 ft. from the main building; it will comprise a duty-room, instrument-room, forge-store, and lavatory, and an engine-house and stabling for two horses, opening on to a large paved yard divided from the main road by a pair of 6-ft. gates. Adjoining the fire-station will be the workshops and stores of the Council's depot, including a messroom, the smith's and wheelwright's workshops. The remainder of the land on this side of the offices building will be used as a depot, provision being made in the future for steam-roller and cart sheds, and stabling for twelve horses. A small dock capable of receiving two barges will be formed on that part of the site lying to the west of the main building for the reception and delivery of the broken granite, sand, paving materials, &c., required in the execution of various works in the district. The alterations, additions, and decorations have been carried out from plans and specifications prepared by Mr. G. Bruce Tones, the Surveyor of the Council, by Mr. John Bloomer, of Brentford.

PREMISES FOR THE "HERALD," GLASGOW.—An extension has just been made to the buildings of the *Glasgow Herald* and *Evening Times*. The building occupies a position at the corner of Mitchell-street and Mitchell-lane. The principal feature of the building is a water-tower, situated at the corner, and rising to a height of 150 ft. The lower part of this tower is unbroken by any cornices or bands running across it. The principal feature of the Mitchell-street elevation is the main cornice, which is placed above the third story from the street. Above the cornice are two stories, the top one being lighted by dormer windows and roof lights. The whole of the new building has access from one staircase situated almost in the centre, in the well of which is a passenger and goods elevator. The floors of the building are of concrete and iron. The floors are laid with American oak. The architects are Messrs. John Honeyman & Keppie, and the principal contractors are—Masonry, Messrs. P. & W. Anderson; joinery, Mr. Matthew Henderson; slating, Mr. John Anderson; plastering, Mr. Wm. Forbes; plumbing, Messrs. Fyfe & Allan; and concrete floors, Messrs. Arrol Brothers. Mr. Robert Aitken is the clerk of the works.

CHURCH, BARROW HILL, DERBYSHIRE.—The church of St. Andrew, Barrow Hill, was opened on the 29th ult. It is built of red brick throughout, and roofed with tiles. The furniture and fittings are of wrought-iron and oak, the whole of the latter having been designed by the architect (Mr. Raymond Unwin, of Staveley Works). The building comprises a nave and chancel, with two vestries attached, one of which contains the organ. There is seat accommodation for 300 persons. The church is heated with low-pressure hot water-pipes and lighted with gas. The contractors were Messrs. Fisher, of Mansfield.

CHURCH, LLWYDGOED, ABERDARE.—The new Church of St. James, at Llwydgoed, was opened on Monday. The church, which is built of brick, stands upon a piece of land on the Merthyr-road. The style of the edifice, which provides seating accommodation for 250 worshippers, is in Gothic, and the total cost of the structure is about 1,200*l.* The plans were prepared by Mr. J. E. Halliday, the Diocesan Architect, and the contract for the building was entrusted to Messrs. Williams & Thomas, Cardiff. The pulpit and the seats are of pitch-pine, and the church is warmed by Porritt's patent heating apparatus. All the windows are of cathedral glass. Surmounting the west end there is a bell-turret.

BOARD SCHOOL, CUMWHINTON, CUMBERLAND.—A new school, which has been erected at a total cost of 2,745*l.* by the Wetheral School Board, has just been opened at Cumwhinton. The face-work of the building is of Cumwhinton stone in courses, with polished dressings of red Howgill stone. The roof is of open timber work in pitch pine, and the wood finishings of the rooms are in yellow pine and varnished. The mixed schoolroom is 46 ft. long and 21 ft. 6 in. wide and 16 ft. high to the tie beam of roof, and the room is designed to accommodate ninety-six children. It is lit by large windows at each end and also by windows near the ceiling at the backs of the scholars. Ventilation is secured by air inlets through the walls and air-pump extractors at the ridge, controlled by closing valves. The infants' room is 26 ft. long by 16 ft. 6 in. wide, and contains a gallery and seats for forty-six children, the whole being finished in a corresponding manner to the larger room. There are separate entrances to both rooms, one for boys, and one for girls; and cloak-rooms with lavatories have been provided. The buildings are fitted throughout with hot-water pipes, the drainage house being detached from the school proper. A masters' house, built in corresponding style to the school, has also been erected on the adjoining half-acre of ground. The work has been carried out

under the direction and according to the selected plans in competition of Messrs. Johnstone Brothers, Carlisle. The following were the contractors engaged in the erection of the school.—Builders work, Mr. James Beatty; joiner-work and furniture, Mr. Joseph Hindson; plumber-work, Mr. W. Forster; slater, Mr. C. J. Nanson; plaster and cement work, Messrs. S. Ferguson & Sons; painter work, Messrs. W. & G. Laidlaw; all of Carlisle; heating apparatus, Messrs. Seward & Co., Lancaster; gates and railings, Messrs. Raybold & Co., Workington; drain-pipes, &c., C. Lonsdale, Cumwhinton. The contractors for the house were—Builder, Mr. William Leighton; joiner, Messrs. Martin & Armstrong; painter, Mr. Palmer; grates, &c., Jardine Carruthers & Sons; plumber, slater, and plaster work by the same contractors as for the school. Mr. Robert Ormiston, Carlisle, acted as clerk of the works.

CHURCH, ALNWICK.—On the 30th ult., the Rev. Richard Leitch opened the new church built by the members of St. James's Presbyterian Church, Alnwick. The new church is erected upon the site of the old church. As there is a comparatively new manse built on the side in the portion adjoining the main road, the entrance to the church has been designed in the most prominent position to be seen from the main road, past the side of the manse, and is further emphasised by the carrying up of a tower to the height of 75 ft., with angle turret, traciced belfry windows, and battlemented parapet. The accommodation of the church, including choir, is for about 700. The building has been erected from designs by Mr. W. Lister Newcombe, architect, of Newcastle. The cost has been about 4,000*l.*

CHURCH, RUBEY, WORCESTERSHIRE.—On the 30th ult., the Bishop of Coventry dedicated the new church of St. Chad's, Rubeby, in the parish of the Lickey. The new church is a wooden erection. It holds 200 people under ordinary circumstances, but by the taking down of a screen it opens out to a seating capacity of 300, part of the building being intended to be used as a Sunday-school. The architect was Mr. W. J. Hopkins, Worcester, and the builder Mr. Stannard, of Bromwich.

WESLEYAN CHAPEL, CHARD.—A new Wesleyan Chapel has just been opened at Chard. The buildings are in the Gothic style. Seating accommodation is provided for about 300, and the cost of the whole scheme is between 3,000*l.* and 4,000*l.* The building has been carried out under Mr. F. W. Curwen, of London (the architect), Mr. C. Turner, of Honiton, being the contractor.

BANK, BRISTOL.—Alterations are being carried out to the offices of the Capital and Counties Bank, Limited, Bristol. They occupy a site at the bottom of Clare-street, which extends back to Baldwin street, and on both of those thoroughfares frontages have been erected from plans prepared by Mr. R. Milverton Drake (now Drake & Pizey), of Bristol. The freestone used for the front has been obtained from the Monks Park quarries. Over the Clare-street entrance are fixed the arms of the bank.

ADDITIONS TO THE CARDIFF FREE LIBRARY.—The news and magazine-room of the new portion of the Cardiff library building was opened recently. In addition to the news and magazine-room, the ladies' reading-room has also been opened. The new reading-room contains about 450 superficial ft. of floor space and provides for 250 persons reading at one time. The ladies' room provides for forty-three readers. The rooms are warmed by hot-water pipes, low-pressure system, and at night they are lit by electricity, the fittings being after designs by the architect, Mr. Seward, of Cardiff.

FLATS, HAMMERSMITH, W.—A large block of middle-class flats are about to be erected in Bridge-road, Hammersmith, parallel to Hammersmith Bridge, and having a frontage to Bridge-road of 306 ft., to Rutland-road 80 ft., and return front to the river of 50 ft. Each flat will be self-contained, with three bedrooms, bath, hot and cold, water-closet, two reception-rooms, kitchen, scullery, pantries, &c., also tradesmen's lift. The flats fronting the river will be superior and more spacious, and will have grand views of the river with balconies overlooking same. The accommodation of these flats will be two large lofty reception-rooms, kitchen, pantries, &c., servant's bedroom and water-closet, service-lift, five spacious and well-lighted bedrooms, dressing-room, linen closets, bath, hot and cold, water-closet, &c. All the bedrooms open into an inner hall apart from the reception-rooms, and both entrance and inner halls will be paved with marble mosaic. The cost is estimated at 20,000*l.*, and the work is to be put in hand at once. Messrs. Fryer & Bath are the architects who have prepared the plans, and are retained by the building owners to superintend the work.

ADDITIONS TO CATHOLIC CATHEDRAL, EDINBURGH.—For several years additions have been in progress at St. Mary's Roman Catholic Cathedral, Broughton-street, Edinburgh. After consideration of various plans, it was decided to erect a new chancel with aisles, and a side-chapel and vestries on the site of the former clergy-house at the west end of the Cathedral; and this, together with the erection of a baptistery at the south side of the Broughton-street front of the building, is the part of the scheme of reconstruction which is now approaching completion. The sanctuary and high altar have always been situated at the west-end of the church, and in con-

nexion with the alterations the west gable has been taken down and rebuilt with one large central arch for the chancel, and two smaller side arches for the chancel aisles. The new chancel is about 50 ft. in length by 26 ft. in width, with a height to the ceiling of 40 ft., the aisles being about 10 ft. wide. The new vestries and side chapel are situated between the north aisle and Chapel-lane. The additions have been designed in the Gothic style. The new chancel has on each side an aisle, the west-end being a semi-octagonal apse, and the whole is lit by nine large tracery windows in the clearstory. The roof is open timbered, of hammer beam construction, with struts springing from carved stone corbels. The spandrels between the roof timbers are filled with tracery. The ceiling is boarded, and the woodwork is stained and varnished, and relieved by a few lines of colour. The floor is to be of marble mosaic. The carved high altar, with its reredos, together with the carved archbishop's throne, canons' stalls, and tracery screens, have been fitted up again in the new chancel. Gifts of stained glass for several of the windows have been received. Gifts in course of manufacture; but, in the meantime, all the windows have been glazed with tinted cathedral glass. The space in the nave formerly occupied by the sanctuary has been furnished with chairs, increasing the accommodation of the church by about 250 sittings. The choir and organ-gallery over the choir is of the Cathedral, the front part of which was very low, has been wholly rebuilt, and the organ placed to one side of the chancel, thus opening up the large central east window which it formerly concealed. A hydraulic blowing apparatus has also been provided for the organ. The baptistery next Broughton-street is not yet completed. It is a semi-octagonal plan, with buttresses at the angles, and three-light tracery windows in the sides, and will have a cornice and parapet carried round it, and a high-pitched roof. The floor is to be of marble mosaic. The walls and ceilings are to be plastered, the latter being panelled with moulded ribs. A large heating chamber is provided below the baptistery. The work is being carried out from the designs of Messrs. Buchanan & Bennett.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, REDDITCH.—On the 29th ult., a stained-glass window in St. George's Church, Redditch, to the memory of the late Rev. G. F. Fessey, was dedicated. The window consists of three lights, and represents the "Ascension." It is the work of Messrs. W. Pearce, Limited, Birmingham.

ALTAR, MAWNAV CHURCH, CORNWALL.—The parish church at Mawnav has just received a new altar for the sanctuary. It is about 7½ ft. long, and the lower parts are of oak, whilst the actual slab is of grey Cornish granite ¾ in. thick. This has the five usual consecration crosses cut upon its upper face. The base is surrounded by a moulded plinth, and the front is divided by three recessed panels. The backs of the panels are diapered. The super altar projects about 10 in. The altar has been made by Messrs. Harry Hems & Sons, of Exeter.

WINDO, ANSFORD PARISH CHURCH, SOMERSETSHIRE.—A new stained-glass window, erected in memory of the late Bishop of the Diocese, has just been unveiled at Ansford Parish Church. The window was supplied by Mr. Drake, of Exeter. It has two lights, in one of which is a figure of St. Andrew, the patron saint of the church and of the cathedral church of the diocese. The other light contains a portrait of Bishop Ken.

FOREIGN AND COLONIAL.

FRANCE.—The Minister of Fine-Arts has just ordered the busts of Marshal MacMahon and Marshal Canrobert for the Ecole Militaire of Saint Cyr. —M. Ruprich Robert *filis*, with the assistance of M. Daumet, has been given the work of restoring the Château d'Amboise, which has just been bought by the Duc d'Aumale. The expense of the restoration is estimated at 1,000,000 francs. —The Société d'Emulation des Côtes du Nord has taken the initiative in a measure which, if it is generally carried out in different parts of France, would be of great service in the cause of archaeology. It has asked everyone who will do so to send a list of Druidic monuments, tumuli, dolmens, covered ways, menhirs, &c., indicating how these monuments should be described, measured, orientated and localised. —The work of erecting a monument in memory of the sculptor P. P. Puget, has just been begun at Marseilles. The work will cost about 100,000 francs. —A monument has just been inaugurated at Beane in Normandy by the Society of the Souvenir Français, to the memory of the soldiers killed on the spot in 1871. —The Minister of Public Instruction has just asked Parliament for a grant of 50,000 francs to enable M. and Madame Dieulafoy to continue their archaeological researches in Persia, undertaken with so much success a few years ago. According to an agreement between France and Persia, France will have the exclusive monopoly of all excavations on the

ground where it is supposed antiquities are to be found. —A new fort is to be erected at Hassi-el-Homair, in Algeria. —The Musée Carnavalet has just received a curious picture of the Pont Neuf in the seventeenth century, at the time when it was the principal and most frequented place in Paris. —A certain number of new decorative paintings have just been placed in the Hôtel de Ville, amongst them: "L'approvisionnement des Halles" by M. Lhermitte, the "Joies de la Vie" by M. Roll, the "Apothéose des Lettres" ceiling by M. Jules Lefebvre, a large decorative frieze by M. Henri Martin, the "Manifestations à la statue de Strasbourg" by M. Adolphe Binet, which is placed in the salon of the Siège de Paris. —The administration proposes to the Municipal Council that M. Bartholomé's monument "Aux Morts" should be installed in Père la Chaise. It will be placed in the central part, under the chapel, and will form a façade to the vault belonging to the Ville de Paris. The expense of installation is estimated at 67,000 francs.

AUSTRIA.—Hungary is to have a new Inspector of Arts, and the Government will probably elect M. Michael Munkacsy to this office. —The special commission on the regulation of the River Danube has lately had a meeting, under the presidency of the Prime Minister, Count Badeni, in which it has been practically determined to transform the old Danube Canal, which runs through Vienna, into a winter river, for the purpose of navigation. —Otto Wagner as to the architectural rendering of the locks and bridges have been approved of. The so-called "Iron Gate" of the Danube is to be opened with much ceremony next year, as the works will then have practically been completed. It is expected that the Emperor of Austria and the Kings of Roumania and Italy will attend the ceremony. —We have referred to the proposal to open a National Industrial Exhibition at Vienna, on similar lines to that which will be opened next year at Berlin. The preliminary arrangements have now been apparently completed, and a date fixed for the opening in 1896. The Vienna arts and crafts societies will probably be most extensively represented in the galleries. —Another new theatre is to be erected in Vienna; its name will be the "Franz Joseph Theatre," and its site will be in one of the principal suburbs. This will be the third suburban theatre at Vienna. —Owing to the damage caused at certain seasons to the lowest parts of the city by the flooding of the Danube, the municipal authorities have now ordered the careful examination of all buildings affected, prior to enforcing preventive measures. —A very excellent map of "Greater Vienna" has just been published. Herr Hartleben is the editor, and has been able to make clearly show the different kinds of property, and all the municipal arrangements, tram-lines, &c. in a small space of 1 to 20,000.

Great strides are being made in facilitating the connexion between London and Vienna. The Ostend express, which leaves Ostend on Tuesdays at four in the afternoon, reaches Vienna at half-past four on the following day (Wednesday). —Some of the principal thoroughfares of Vienna are now to be lighted by electricity, and temporary lights are being put up on the "Freiung." The International Electricity Company holds the contract. —A large number of old Vienna houses are now in the hands of the housebreaker to make room for the new Metropolitan Railway, and a number of historical associations will disappear with them. The *Freie Presse* of Vienna, which publishes an excellent historical sketch of some of the buildings, from which we see that a number of the houses date back as far as 1425 and 1500. One of the buildings, the so-called Casa Piccola House, which has been demolished, was used in 1809 for Napoleon's Council of War. It is very easy to follow the history of the buildings in Vienna, owing to the elaborate notes always made in the official conveying books. —A large forage warehouse has been completed for the court offices at Vienna, which, having been equipped with all modern improvements and appliances, will be found an interesting building. —A competition has been opened at Vienna for a scheme of municipal electric railways. —Dr. Friebeis, the imperial commissioner, who takes the place of the defunct city council, has officially stated that decisions must almost immediately be given as to the extension of the Vienna water supply, the system of electric railways, and the municipalisation of the gas works. —Whilst the electric-light is being provisionally introduced for the illumination of some of the main thoroughfares at Vienna, experiments are also being made with improved gas-burners in some of the streets, notably, the Herren-gasse and St. Michael's-place. Incandescent lights (the Auer patent) are being tried here, and good results are being obtained. The gas supply of Vienna is in the hands of an English company—the Continental Gas Association—whose concession, we understand, however, soon expires, when there will probably be a municipalisation of the service. The company has, we believe, had the monopoly since 1843. Previous to this, there were some small gas works at Vienna, whose interests were, however, bought up. —We regret to announce the death of the "Court Painter and Modeller," Herr Detoma, at the age of seventy-five. Herr Detoma, an Italian by birth, is responsible for much of the excellent

plaster decoration, which is such an important feature in the Opera House, the new museum, and other modern public buildings in Vienna. The first important piece of work at Vienna by the deceased was the ceiling of the Royal Exchange. He was constantly working under Hansen, Ferstel, Hasenauer, and other notable architects, and participated in the decoration of the Bavarian castles of Louis II.

MISCELLANEOUS.

THE METROPOLITAN CATTLE MARKET.—The Corporation of London will apply to Parliament in the ensuing session for leave to bring in Bill for altering, and, so far as may be found expedient, repealing the several Acts now in force which relate to the Market at Islington. This measure provides for a transfer by them of certain roads connected with the Market Estate and property of the Corporation to the vestries of St. Pancras and St. Mary, Islington, or to some other highway authority or public body, and imposes on such public body the obligation of maintaining the same; for the removal of any of the existing gates and bars, and their re-erection elsewhere, and the erection of new ones, within the estate; also for empowering the Corporation on certain days and at certain times, as they may deem fit, to set apart spaces (on the roads) for the temporary use of vendors of goods and miscellaneous commodities, or other like purposes, and to levy tolls, rates, and charges in respect of the goods brought into the market, or for the use of the spaces so allotted to their sale.

A NEW SET OF CLOCK CHIMES.—A large new clock has just been erected in the parish church, at Freshwater, Isle of Wight, by Messrs. John Smith & Sons, Derby, which has a large dial, strikes the hours, and plays the new "Tennyson" chimes, which were the joint composition of Messrs. Frank & John Smith, partners in the firm. The chimes seem a little uncertain in tonality, but this is perhaps not out of keeping for bell music; and a new set of chimes is not un- welcome, at all events.

A WARNING AS TO PRETENDED ELECTRICAL WORKMEN.—Mr. Hughes, the Secretary of the Cancer Hospital at Fulham, asks us to call attention to the danger of admitting persons professing to be electric workmen into a building without due knowledge with regard to them. The Committee of the Cancer Hospital recently decided to adopt the electric light; an estimate was accepted and the work commenced, when on a Saturday a man (who had evidently watched the workmen depart) called shortly after one o'clock, stating he had come to meet the foreman and to arrange where the switches were to be fixed. He was taken all over the building by the porter, and eventually got into the nurses' dormitories at the top of the building, found one of the servants there, told her he had come to measure in connexion with the electric lighting, and thus gained access to the bedrooms, whence he took with him three watches, several articles of jewellery, and all the money he could find from four bedrooms. Needless to say, he had nothing to do with the electric lighting of the hospital, but by the careful measurements which he took and the marks which he put on the walls to show where the switches were to be, he effectually gulled the officials.

CONFERENCE ON LIGHT RAILWAYS.—Two meetings were held in London last week at the Westminster Palace Hotel, to discuss the question of light railways. The more important of the two meetings took the form of a conference, under the chairmanship of Sir Albert Rolitt, which met on Thursday last week. The deep and increasing distress among British agriculturists, and the promotion of schemes for extending and cheapening the means of communication as palliatives of that distress were discussed. From all sides it was urged that Government co-operation, either by guarantee of interest or temporary financial support, had become an absolute necessity. The meeting formed itself into a Light Railways Association, and for the purpose of considering and formulating schemes, a committee was nominated on which representatives of County Councils, Chambers of Commerce, the Institution of Civil Engineers, the Surveyors' Institution, members of the two Houses of Parliament, and representatives of Agricultural, Railway, and Tramways Associations were invited to serve. A resolution was passed in favour of urging upon Government to introduce at the earliest possible opportunity in the next Session proposals to facilitate the construction of much-needed light railways in agricultural and sparsely-populated districts in England, Scotland, and Wales. Among the many interesting communications made to the Conference was the statement that, whereas the 20,908 miles of railway in Great Britain had cost 98,000,000 sterling, or at the rate of 47,000l. per mile, railways of narrow gauge of 24 in., 18 in., or even 15 in., were doing excellent service in many districts abroad and in the few districts where they were in operation in this country, though the cost might not exceed from 1,000l. to 2,000l. per mile. Mr. Morrison, M.P., instanced a line laid in the billy country near Derby by Mr. Hayward, which had been constructed for 1,000l. per mile, and upon which recently saloon-carriages containing a large company had been run

probable date is 1710. About nine dozen pewter spoons were also found, with "C. of R." meaning "Corporation of Reading," and "Corporation" on them. Mr. Webb also brought to light 103 dozen old Sheffield plate large spoons, inscribed with the borough arms, contained in a small box some eighteen inches square.

ELECTRIC LIGHTING OF RAILWAY CARRIAGES.—There was a demonstration on the 27th ult. on the London, Tilbury, and Southend line of a new system for the electric lighting of railway carriages. The principal features of the system are that each carriage is provided with its own generating plant complete in itself, the revolution of the axle of the carriage driving the dynamo, and thus producing the electricity for lighting the carriage while in motion, and also storing sufficient electricity in the accumulator to supply the light when the train is stationary. Hence each carriage is lighted independently. The dynamo is suspended from the under-frame of the carriage in such a manner that although driven by a belt from the axle, none of the vibration of the axle is transmitted to the dynamo. The speed of the train may vary, the dynamo always runs at a uniform rate, and consequently always produces the same amount of current. The system is by Messrs. J. Stone & Co.

PANELS AT THE ROYAL EXCHANGE.—For some years past it has been in contemplation by the Gresham Committee to decorate the panels around the ambulatory of the Royal Exchange. It was not, however, until 1860 that the scheme took a practical form. Mr. Deputy Snowden, then Chairman of the Committee, promised to fill in the first panel at his own expense, and Sir Frederic Leighton, P.R.A., simultaneously offered to paint and present another. The gift was accepted by the Committee, and was called in Sir Frederic Leighton, Mr. Calderon, R.A., and Mr. Poynter, R.A., to assist them in arranging a plan for filling in the remaining twenty-two panels, and in selecting the artists and the subjects of the frescoes. The two first panels were unveiled last June—the one painted by Mr. Calderon, R.A., and depicting the opening of the Royal Exchange by the Queen in 1844, and the other by the President of the Royal Academy, entitled "The Phœnician trading with the Britons." The Corporation acting through the Gresham Committee, of which Mr. Deputy White is now the Chairman, have commissioned Mr. Seymour Lucas, A.R.A., to fill in a panel with a representation of "William the Conqueror Granting a Charter to the Citizens." Mr. Carl Meyer, of New Court, has promised a panel representing "The Offer of the Crown to King Richard III. in Baynard's Castle," to be painted by Mr. Sigismund Goetze; and Sir Samuel Montagu, M.P., has offered a panel portraying "Charles I. Demanding the Five Members at Guildhall," by Mr. Solomon. The Mercers' Company will contribute a panel representing "The Opening of the Royal Exchange by Queen Elizabeth," but they have not yet selected the artist. The subjects of the remaining eighteen panels have also been selected by the Committee and their art advisers.—*Standard*.

LEGAL.

ARBITRATION CASE AT THE COURT OF APPEAL.

BEFORE Lord Esher, Master of the Rolls, and Lords Justices Lopes and Kay. *Re* an arbitration between Ernest Alfred Roome and the Commissioners of Public Baths and Washhouses for St. John at Hackney.

This was an appeal by the Hackney Baths Commissioners from the order of Mr. Justice Wright at Chambers giving Mr. Roome leave to enforce an award dated September 6, 1895, as though it were a judgment.

The matter arose out of a contract dated February 16, 1894, under which Mr. Roome contracted to build public baths at Hackney for £5,668*l.* The works were suspended in October, 1894, and Mr. Roome made certain claims which were dealt with by arbitration. The award of Mr. Cubitt Nichols, the arbitrator, was given in September last, and he awarded £3,321*l.* to be paid to Mr. Roome in final settlement of all his claims, and gave him the costs of the arbitration and award. The Commissioners claimed to retain the £3,321*l.*, or alternatively some part of it, under Clause 22 of their contract, as security for extra cost of completing the baths.

The Master of the Rolls in his judgment said: "I am of opinion the Appeal must be dismissed. No fault is found now with the award as an award, but what is said is the judge ought not to have made the order. Now what is it that is given by the award? Here is the contractor who has done work for these Commissioners, and it is true to say that the Commissioners took possession of all the work that he had done, and of all his tools, and of his plant, and then they complain. What did he complain of? The very first thing to look at is he was ordered to give particulars; they will show what he does complain of. He says 'you took possession of my things, and prevented me fulfilling the contract, but what I complain of is, that it was your fault which prevented me from finishing the work.' I cannot say that you were not entitled to take possession because I have not finished the

work; but what I complain of is that your man, by gross misconduct, not only with regard to the work which I was carrying on with my workmen, but also by misconduct with the tradesmen who were supplying me with goods, your clerk of the works prevented me from finishing my contract, and you stipulated that you would not interfere with my work, and you ought to pay me damages, inasmuch as they are caused by a breach of contract by you. Now, if the breach of contract was established, what was the remedy? Damages, and nothing else. What would be these damages? By their breach they may have brought it within the terms of the 22nd Clause of the contract, but it was a breach of the 10th Clause. If that were true, what were the damages? Why, the difference between the condition he would have been in if they had not committed that breach, and the condition in which he was when they had committed that breach. If they had not committed that breach he would have been entitled to the value of the work which he had done, but he could not claim that because he had not finished the work, and he did not give up the work voluntarily, but because they prevented him from doing the work. The moment that was established the value of the work that he had done was part of the damages. But that was not all. He was prevented from earning the rest of his profit of the contract, that is, the profit that he would have made if he had carried on the work. Whether the Arbitrator has now given more damages than he ought, is immaterial. There is the award, which is in terms perfectly plain, that the Commissioners were bound to pay £3,321*l.* What for? 'In full satisfaction and discharge of all claims and demands whatsoever of the said Roome against the said Commissioners under the said contract, or in respect of any breach thereof.' The truth is that these damages are all given in respect of the contract and under the contract, but in respect of a breach of it, that breach being that they prevented him from finishing the work. That being so, there is an absolutely good award, a final award, and it is specific, an award that they should pay him the money at once. I cannot say that the Judge was wrong. I am perfectly certain that he was absolutely right in saying upon such an award that there should be no delay. It is an award for damages, and therefore there is no power on their part to retain the money. They are bound to pay it at once. I think the learned Judge was right, and this appeal must be dismissed."

Lord Justices Lopes and Kay concurred, and the appeal was dismissed with costs. Mr. Moulton, Q.C., and Mr. Macmorran appeared for the appellants, the Commissioners; and Mr. Dickens, Q.C., and Mr. R. M. Bray for the respondent, Mr. Roome, the contractor.

BUILDING ON DISUSED BURIAL-GROUNDS.

INTERESTING CASE IN THE CHANCERY DIVISION.

The case of the Attorney-General v. the Trustees of London Parochial Charities and others came before Mr. Justice Stirling, in the Chancery Division, on Friday and Saturday, the 29th and 30th ult., it being an action brought by the Attorney-General at the relation of the Vicar and Churchwardens of the Parish Church of St. Botolph Without, Aldersgate-street, to restrain defendants, the Trustees of London Parochial Charities, from building on certain plots of land situate on the south-side of Little Britain, on the ground that such and formed part of a disused burial-ground, and that building upon it was prohibited by the Disused Burial-Grounds Act of 1884, that Act being passed after the order in Council was issued for closing Metropolitan burial-places, and by which Act and by another Act passed in 1887 the term, "burial-grounds" was defined to include any consecrated or unconsecrated ground which had been set aside for the purposes of interment.

Mr. Graham Hastings Q.C., and Mr. Stokes represented the Attorney-General; and Sir Walter Phillimore, Q.C., Mr. Buckley, Q.C., and Mr. Ralph Nevill the defendant.

Mr. Hastings, in opening the plaintiff's case, said that the first question his Lordship would have to try was, whether the land in question had been used as a burial-ground, and next, whether it was within the terms of the Act of 1884, c. 27, for the prevention of the erection of buildings on burial-grounds after the passing of the Act, and for the purposes of which numerous orders in Council had been made. A further Act was passed in 1887 which suspended certain provisions in other Acts in certain places. St. Botolph Without was an extremely old church; in fact, one of the oldest in point of time. It was referred to in a writ of Edward I. in 1279. In the reign of Richard II. it was incorporated with the Royal Chapel of St. Martin's-le-Grand, and Henry VIII. in 1532 granted it as a free chapel to the Priory and Monastery of St. Peter, Westminster. In 1542, the same King granted the rectory to the Dean and Chapter of Westminster. It appeared that at that time and for some time after, there were no houses on the plot of ground lying between Bun and Mouth-street and Little Britain. The wall, which was marked on the plan, was not then in existence, and the churchyard

extended from a place some way below right up to Little Britain. According to Ryter's map, dated 1504, in the British Museum, there were then no buildings upon it, but soon afterwards some houses must have been erected upon it, because in the year 1614 there was a grant by King James I. of "The Church House lying and being in Aldersgate, near the 'Peacock' there at the yearly rent of 3*s.* 4*d.*, and all the garden at the yearly rent of 3*s.*, and all those three shops adjoining the churchyard on the east at the yearly rent of 2*s.* And three tenements situate lying and being in the Parish of St. Botolph Without, on the north part of the church and churchyard aforesaid, at the yearly rent of 3*s.*; and also all that our tenements, with the appurtenances belonging, situate lying and being within the Parish of St. Botolph, in the churchyard, now in the occupation of Simon Kingsland, at the yearly rental of 15*d.*"

His Lordship here remarked that from a document in Latin before him it appeared that three of the houses referred to were in the parish of the churchyard. The fourth was described as a tenement lying and being in the said parish within the cemetery.

Mr. Graham Hastings replied that Kingsland's house was the minister's house, now marked 773, and originally there had been a communication between that house and the church. At a later date the house had been used for the purposes of a school, and the doorway was closed up. Since then a sort of casing had been put over the church, and the doorway was visible no longer. In 1884 the Ecclesiastical Commissioners sold 77a, 78, 79, and 80, Little Britain, to the Commissioners of Sewers, and this sale was obviously made by the Commissioners as the representatives of the Dean and Chapter. There was a reference to arbitration, and the sum awarded to be paid for the property was 3,845*l.*, and the whole property, including the passage leading to the church-house, was acquired by the Commissioners of Sewers, who subsequently made terms with the builders for the demolition and re-erection of buildings on the site in question. In July of last year the builders began to excavate, but only on a small scale, because they had not got the proper provision for removing the remains. The plot comprised the frontage in Little Britain right up to the wall, and in excavating the workmen came upon enormous quantities of human remains, and it was impossible to suppose that such remains would be found in any other place than a burial-ground. Cartloads of loose bones were found, and bones were also found in connexion with coffins. In one case the coffin was entire, and on being opened the skeleton could be seen inside, and then the whole crumbled to dust. The suggestion made by the defendants was that the general absence of coffins indicated that the place was the site of a plague-pit; but in the learned counsel's opinion, it was not tenable, as he could prove that there was a vestry order issued in 1620 as to the "burial of parishioners old and young," showing the fees charged "for burial with coffins and also the fees for burial without coffins." It was hard to suppose that so vast a plague-pit could have been opened up as the spot in question measured about 114 ft. in length. There could be no doubt that this was part of the old burial-ground, the other, or lower part of which had about 1853 been converted into a public garden.

Mr. Hastings then discussed the application of the Act of 1884, in face of which no buildings could be erected unless a faculty for building had been obtained before the passing of the Act of 1884, or unless the churchyard had been sold or disposed of under the authority of an Act of Parliament. Evidence having been given to show that the passage-way referred to had been paved with old gravestones on which the inscriptions were visible and which recorded the discoveries made during the excavations of the ground, Sir Walter Phillimore submitted that the ground was never "a place set apart for interment," and had never been used as a graveyard. His contention was that the ground was the site of some old church-house, of which there were a number in the early times in connexion with Monasteries. He contended also that the Commissioners of Sewers had authority to deal with the land in question under and by virtue of the City of London Sewers Act of 1851, which Act gave the Commissioners express power to sell.

Mr. Buckley followed on the same side, and Mr. Hastings having replied,

His Lordship intimated that he would reserve his judgment.

MEETINGS.

FRIDAY, DECEMBER 6.

Architectural Association.—Professor Herkomer, A.R.A., on "Scenic Art," 7.30 p.m.
Institution of Junior Engineers.—Paper on "Considerations with Respect to Water, Gas, and Electric Mains, &c., in Connection with the Formation of Urban Roads and Footways," by Mr. J. Julian. 8 p.m.

SATURDAY, DECEMBER 7.

Sanitary Inspectors' Association (Carpenters' Hall, Throgmorton-street).—Mr. J. M. Jones, on "The Public Health Acts, with Suggestions for their Improvement so as to Secure their More Effective Operation and to Simplify Procedure." 6 p.m.

CONTRACTS—Continued.

Clapton, f., e.r. 34l., 400l.—By *Douglas Young*; 51 to 5
Litcham-st., Kentish Town, f., r. 175l. 12s., 800l.; 27, S

MERTHYR TYDFIL.—For the execution of water-works, including a reservoir south of the Brecon Beacon on the Taff below the falls, by means of a masonry dam, for the Urban District Council. Mr. Geo. F. Deacon, engineer, 39, Victoria-street, Westminster, S.W. —
Holme & King, Westminster and Liverpool, at schedule of prices.

NORWICH.—For additions to premises, Magdalen and Botolph-street, Norwich, for Mr. Frank Price. Mr. J. W. Howard, architect, Norwich —
Downing & Son, £309 Tyrrill & Bro. Norwich * £310
E. Gunton, £313 * Accepted.
(Architect's estimate, £313.)

OSWESTRY.—For the extension of vagrant wards at the Work-house, Morda, Oswestry, for the Directors and Guardians of the Oswestry Incorporation. Mr. A. Puleston Madox Jones, Great-worth, Oswestry. Quantities by parties tendering:—
Thos. Meredith £410 0 0 D. Davies & E. Jones,
Eyre & Jones 415 14 3 Upper Church-street,
W. H. Thomas 359 0 0 Oswestry (accepted), £347 15 0

RUGSEY.—For the execution of water supply works, Brecon, for the Urban District Council. Mr. W. E. Rogers, surveyor, Rugsey. Quantities by surveyor:—
L. E. Sidebottom £201 5 0 C. J. Nevill, Stafford * £215 0
W. H. Sprague 25 14 9 * Accepted.

RUSHDEN (Northants).—For making roads and laying sewers, Oakley building estate. Mr. G. F. Bean, surveyor, Corn E. Change, Wellingborough —
W. T. Hall £221 W. J. Willmott, Rushden * £207
George Henson 181 * Accepted.

ST. LEONARDS-ON-SEA.—For the erection of three shops and dwellings over the same, at 12 and 13, Bonema-road, for Mr. John Warren. Mr. William Cooper, architect, 14, Havelock-road, Hastings:—
I. Weathered £1,183 J. Geary £1,130
W. E. Warman 1,795 Padgham & Hutchinson 1,268
J. E. Crutenden 1,714 A. H. White, St. Leo-
C. W. Pelling Hurrell 1,398 nards (accepted), 1,188

ST. LEONARDS-ON-SEA.—For the erection of a convalescent home for railway men, for the committee of the Railway Mission. Mr. F. H. Humphreys, architect, Hastings:—
J. Shillito & Son £5,700 A. H. White £4,731
J. Potter & Sons 5,601 C. Hughes 4,730
P. Peters & Sons 5,393 Eldridge & Crutenden 4,710
J. H. Foster 5,811 P. Crutenden 4,679
J. Lester 5,099 Padgham & Hutchinson 4,454
H. E. Crutenden 4,095 P. Jenkins, St. Leonards-
J. Longley & Co. 4,075 on-Sea * 4,473
S. H. Snow 4,599 * Accepted conditionally.

ST. LEONARDS-ON-SEA.—For the erection of a detached house in St. Matthew's Gardens, for Mr. J. Cooke. Mr. William Cooper, architect, 21, Havelock-road, Hastings. Quantities by the architect:—
C. Hughes £1,785 Padgham & Hutchinson £1,530
T. Salter 1,750 A. H. White 1,471
W. E. Warman 1,601 P. G. Mattos 1,415
W. C. Gammans 1,640 C. W. Pelling Hurrell, St.
A. E. Crutenden 1,610 Leonards (accepted), 1,350
H. H. Snow 1,600 J. Geary 1,399

SEAFORD (Sussex).—For the erection of cottages in Hindover-road, for Mr. William Lambie. Mr. William Cooper, architect, 21, Havelock-road, Hastings:—
J. Gauden £2,850 H. E. Crutenden £2,320
A. H. White 2,600 Padgham & Hutchinson 2,239
J. H. Berry 2,571 Wilkinson 2,220
S. Moring 2,461 E. Bismarck 1,952
S. L. Ford 2,490

SOUTHAMPTON.—For the execution of private improvement works, Bond-street and two other streets, Northam. Mr. W. B. G. Bennett, Borough Surveyor, Municipal Offices, Southampton:—
W. L. Chichester £1,985 0 0 Crook & Batten £699 7 0
M. Hall 1,795 12 10 F. Osman, Southamp-
H. W. Bull 92 0 0 ton (accepted), 97 0 0
Fayfar & Toole 994 10 0

UPTON PARK.—For the erection of a block of school-buildings to be known as the Hand-road schools, for the West Ham School Board. Messrs. Newman & J. H. Lee, architects. Quantities by Messrs. Curtis & Son:—
W. J. Middleton £22,161 Stumpson & Co. £19,577
Reed & Son 19,997 Kirk, Knight, & Co. 19,764
C. G. Hill 19,997 Greig & Son 18,866
H. Flint 19,997 C. Sharp, Stratford * 18,591
* Accepted subject to the approval of the Education Department.

WINDSOR.—For additions, &c., to a lion workhouse, for the Lion Guardians. Messrs. Edington and Summerell, architects, 29, Park-street, Windsor:—
J. Akerly £2,300 J. Morris & Sons £1,105 0
Beauchamp & Rowland 2,475 10 Develin 2,171 0
Gibson & Son 2,377 10 Gray 2,154 0
Hitch 2,320 W. Watson 2,148 0
Pether & Son 2,280 C. H. Tuckwell 2,131 0
E. Bampfield 2,260 C. Simmons, Reading * 2,026 0
A. H. Keavell 2,198 0 * Accepted.

WOLVERHAMPTON.—For additions to school buildings, Dudley-road, for the School Board. Mr. J. H. Fleeming, architect, 102, Darlington-street, Wolverhampton. Quantities by the architect:—
Bradley & Lloyd £1,140 Gough £2,503
Ham Bros. 3,660 Johns 2,889
Baker 3,610 Gurn & Son 2,880
Nasby & Son 7,022 Chas. Wolverhampton * 2,766
Winlock & Co. 2,241 Horton 2,563
* Accepted.

YORK.—For the supply of the ironwork required in the construction of a weir, Castle Mills Lock, for the York Navigation Committee of the York Corporation. Mr. A. Crear, C.E., Guildhall, York:—
Messrs. Barker & Sharp, Peasholme-green, York, £262 19 8

WOODFORD.—For building a detached villa-residence at Barclay Oval, Woodford, Essex, for Mr. A. Scott. Mr. R. C. Murray, architect, 1, Racquet-court, E.C. Quantities by Mr. R. E. Crossland, quantity surveyor, 1, Racquet-court, E.C.:—
Goddard & Son £1,461 Knight & Son £1,448
Woodward & Co. 1,549 Somerton & Son 1,439
Harris & Wardrop 1,473

TO CORRESPONDENTS.

G. C.—W. H. W.—G. & J.—B. & G. (amounts should have been stated).—J. V. (below our limit).—S. & Co. (too late, next week).

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The Builder.

VOL. LXIX. No. 2528.

DECEMBER 24, 1895.

ILLUSTRATIONS.

Hammered Silver Altar Cross, Salisbury Cathedral.—Mr. E. Doran Webb, F.S.A., Architect	Double-Page Ink Photo.
Ashorne Hill House: Interior of Hall.—Mr. E. Goldie, Architect	Double-Page Photo-Litho.
Stables at Shaw Hill, Wiltshire.—Mr. E. J. May, Architect	Double-Page Ink-Photo.
Proposed Cottages at Harrow.—Mr. T. Phillips Figgis, A.R.I.B.A., Architect	Single-Page Ink-Photo.
House, near Leicester.—Mr. James Ransoms, A.R.I.B.A., Architect	Single-Page Ink-Photo.

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Professor Herkomer's Suggestions on Scenic Effect.



WE can hardly think that Professor Herkomer's manner of putting his views before an important architectural society last week was very complimentary to that Society. The paper was read, it appears, only on the condition that it was not to be discussed; that is to say, that Professor Herkomer would condescend to explain to the meeting how to do it, on condition that they listened to him with reverence and did not presume to question any of his views. This is not the footing on which papers are generally read at the Architectural Association, and considering that very distinguished artists and architects have from time to time appeared there as readers of papers, and have listened to a full though no doubt respectful discussion of their opinions, we are rather at a loss to understand why an exception was to be made in this case. The idea that the meeting had everything to learn from the reader of the paper, and that he had nothing to learn from them, is one which is no doubt sometimes entertained by lecturers, in their inmost minds, but it is not generally openly acted upon, and in this case we are inclined to think it was erroneous, and that probably some suggestions might have been made in the course of discussion which would have been worth the consideration even of Professor Herkomer, as well as of other persons interested. The matter is hardly mended when we consider (what some of the audience perhaps were not aware of) that the paper read to them was practically identical with one which had already appeared in a monthly art magazine, where the illustrations exhibited had also been published.

As we are not under the fear of Professor Herkomer, we may say that one or two of the most important points in connexion with the subject from an architect's point of view, points on which possibly some of the audience might have been able to say something useful, were not touched upon at all. A great deal was said about the treatment of

natural scenery on the stage, but not a word as to the treatment of architecture, which is one of the branches of scene-painting and scene-setting that is most in need of reform, being in fact a subject on which scenic artists are very ill-informed and apparently absolutely indifferent. As a general rule stage architecture is entirely nondescript; and no doubt when the scene of a play or an opera is laid in Fairy-land or No Man's land, as it sometimes is, the scene-painter is quite at liberty to indulge his fancy as he pleases. But a large majority of plays profess to represent action which took place at a definite time and in a definite and known country; and we never remember to have seen any play in which architecture formed an important part of the scene where the architecture represented correctly any known building or style, even when it professed to represent a particular building, and when no expense was spared on the mounting. We recall at the moment two particular instances in important plays which were to run for a long time. One of these was "Beckett," where the supposed scene in Canterbury Cathedral was quite impossible in its laying-out, and full of archaeological blunders, in regard to which we were told by some of the people called "art critics" that correctness in an architectural representation on the stage was of no consequence whatever. The other case we refer to was a scene in one of the Gilbert-and-Sullivan operas, which professed to represent the interior of a gallery or banquetting-room in Haddon Hall, where there was a timber roof such as never existed either in Haddon Hall or any other ancient building in England, and which moreover was tawdry and vulgar in design. It might certainly have been thought that a painter treating of the subject of scenic art to an audience of architects might have been glad to know what their views were as to stage architecture, and he might have learned some things from them on this subject which painters in general do not know.

The criticism in regard to the general shape of the modern theatre—the "well-hole" shape Professor Herkomer calls it, in which some of the spectators are below the level of the actors and some of them high above, is of course perfectly rational in itself, but it would have been of more practical use if it

had been accompanied by any suggestion as to how the dilemma is to be avoided. Of course it would be far better in regard to the scenic effect as observed by the spectators if they were all ranged on one floor slightly curving upwards from the stage level, and the appearance of the house could be rendered much better, architecturally, on such a scheme; but it is a question of money. Professor Herkomer suggested that to provide a theatre in which all could be seated in this manner, and which would accommodate a sufficient number to render the house a paying one, would be an interesting problem for architects to consider. If he had allowed the architects any opportunity to say what they thought, they, or some of them, would probably have replied that it is a completely hopeless problem except by raising prices all round, or at all events doing away with cheap seats; and how will the public like that? No doubt the audience in the gallery see the play at a disadvantage, but they would much rather see it in that way than not see it at all; and that, as long as a theatre is a commercial speculation, is the only alternative. To enable a theatre to pay its way, it must seat a certain minimum of persons, and they cannot all be seated on one floor, because to attempt that would necessarily be to put some of them so far from the stage that they could neither see nor hear the actors properly. A theatre cannot be expanded like a concert room (and even our concert rooms are getting too large for the proper enjoyment of music), because it is a question of seeing the actor's features and hearing the speaking voice, which cannot carry so far as the singing voice. There are only two methods of reform possible. The stalls might be commenced at a slightly higher level, so as not to place the spectators so much beneath the actors, and this high-paying section of the audience being given a more favourable point of view for the figures on the stage than they at present have, there would be an improvement so far, which would not be in any way interfered with by the fact of the existence of the circle and gallery overhead, the occupants of which, as already observed, would rather see the play from that disadvantageous position, at a low price, than not see it at all; which is under present circumstances the only alternative. The only other condition under which the "well"-shaped

theatre could be abandoned would be in the case of theatres subsidised by Government (as is frequently the case on the Continent), in which the management are not under the necessity of thinking of profits before everything else. But we can hardly expect this system to be largely carried out, nor would it perhaps be altogether beneficial to dramatic art; although a representative national theatre partially supported by the State, like the Théâtre Français, would no doubt be a boon both to dramatists and the public.

The suggestion for a proscenium opening which can be enlarged or diminished at pleasure is more applicable to a small private theatre than to a large house. Whatever painters may think, it is an absolute necessity in a large theatre that the proscenium arch should be assimilated in character and scale to the general design of the interior; it must have to a certain degree a monumental appearance—ought to have more of this than it generally has; and we cannot see any possibility of designing and constructing a proscenium opening on a large scale so that the visible sides can be brought together and the top lowered, without producing a very bad architectural and decorative result when this is done. Moreover, on a large scale the practical difficulty of working this arrangement would be much greater than on a small scale. The only way in which it could well be done would be by having a movable proscenium screen of the kind indicated, immediately behind the permanent proscenium arch, or working in a groove between a double wall. The portion of this which would become visible, inside the lines of the proscenium arch, when the opening was reduced, could then be treated so as to present a decorative appearance towards the house; but the main proscenium arch must remain as a permanent portion of the architectural design. There is another difficulty also, in the case of a lofty house with galleries (which, as we have shown, is a practical necessity for economic reasons), that the smaller opening would probably interfere with the view of the actors from the upper part of the house. In short, what would be suitable and easily managed in a small private theatre with the audience on one floor, may be difficult to work and unsuitable to the conditions of a large public theatre. Still, the possibility of adopting this arrangement is quite worth consideration, and no doubt Professor Herkomer's criticism as to the absurdity of having a room the same size in cottage and palace alike is perfectly justifiable in itself. The conditions of the stage, it is true, are essentially artificial and conventional; but this is a convention which, it may be admitted, requires the spectator, like Dickens's "Marchioness," to "make believe very much."

In all Professor Herkomer's suggestions as to the treatment of the landscape, the sky, and above all "the moon," we feel much interested, and all of them are possible in any theatre, irrespective of the general design of the house. His method of building up a back scene in the solid, so as to have real perspective and shadow effects, is admirable, and may be hailed as a chance of ridding us of the kind of stage tree or bush which, as was observed at a Cambridge performance of a Greek play, is "rather too obviously in two dimensions." His stage moon, we trust, may ere long be seen rising elsewhere than at Bushey, now that he has shown us how to do it; and his suggestions for the sky ought to lead to the substitution of something better than the usual arrangement of clothes-lines in parallel rows. The ridiculous trick of following an actor about the stage with the glare from a lime-light bull's-eye, a kind of peripatetic moonbeam, in order that the spectators may see his face in a night-scene, has long amused us quite as much as it has amused Professor Herkomer. As to the question of the footlights, however, there is something to be said on both sides, and we are not sure

that there is not as much to be said in their favour as against them. That they light the countenances of the actors from the wrong point is the serious objection, and no doubt it is a very serious one. But on the other hand they have certain beneficial effects both in regard to the spectators and the actors. From the spectator's point of view they put everything on the stage in a special light which, just because it is not natural, has an important effect in removing the scene from reality, giving it a kind of idealised appearance, and masking to some extent what would otherwise be the too realistic aspect of made-up scenery. In dramatic art we do not aim at pure realism, either in the play, the acting, or the scenic effect; and any such aim only defeats itself. Drama is a conventional representation, and it is just as well that it should be produced under a conventional lighting which removes it from all pretence of realism. And from the actor's point of view, we have heard it observed that the glare of the footlights is a very important assistance in interposing a kind of veil between them and the audience, cutting off the audience from their notice to a certain extent, and assisting them to forget the spectators and concentrate their minds on the business in hand. For a large stage, again, it is somewhat doubtful whether any other system would so well answer the purpose of thoroughly lighting the stage; and here again there is a difference between the conditions of a small theatre and a large one. On the whole, we are inclined to think that the footlights are not likely to be lightly abandoned.

THE SHOREDITCH COMPETITION.



Nothing that strikes one strongly in connexion with the competition for the new Public Library and Baths at Shoreditch, the drawings for which are now on view, is the amount of work which has been asked for from competitors. The premiums offered are of fair amount, as premiums go, but the amount of detailed work which has been required from architects in order to take their chance of obtaining one of these premiums is really unconscionable, and ought to be strongly protested against. The competitors have had in the first place to prepare drawings on a working-drawing scale ($\frac{1}{4}$ in. to the foot), with three elevations, two sections, a perspective view, a detail of part of the elevation, a detail to the same scale ($\frac{1}{4}$ in.) of the counters of book-cases in both lending and reference library, and a detail showing collapsible or removable dressing-boxes for the first-class swimming-bath; a plan of the engineering arrangements of the baths, and the heating of both buildings. To require architects to go into all these details, besides sending in a set of finished drawings to a working scale, on the mere chance of being selected as the best, is a sign of the continued tendency to further encroachment on the long-suffering of competing architects, and ought to be strongly protested against. Of course it may be said that it is the fault of the architects that they accede to such requirements; but it is none the less unreasonable on the part of competition committees to make them.

The competition was for the erection of a public library on the north-west corner of the site, the principal (west) frontage of which faces Pittfield-street, Hoxton, and of public baths and wash-houses over a considerable portion of the remainder of the site. The south-west corner of the site is occupied by an existing building, but there is free access on the north and on the greater part of the west and south sides of the site, which is nearly square in its lines, and therefore not an unfavourable one. The baths department was to be entirely separate from the library block, the limits of the two being defined on the block plan; and the baths included first-class and second-class swimming-baths for men, with the capability of the former being used for

women on stated days. This is a very unsatisfactory arrangement, and in the present day it seems absurd to plan swimming-baths without a separate bath for women, of whom the better classes learn swimming as much as the men, and those of the humbler class would probably do so if more opportunity were afforded them. The larger swimming bath was to be capable of being used in winter as an assembly hall, and arranged so as to meet the County Council regulations as to exits. This and the requirement to provide for the use of the first-class men's swimming-bath by women when wanted formed two of the difficulties of the plan, and have not been satisfactorily met by many competitors. Architecturally, there would arise also the question whether the façade to Pittfield-street, which would be necessarily occupied partly by the library and partly by the bath buildings, should be treated as a uniform façade, or should be characteristically treated so as to distinguish the two departments externally. Competitors have had different views on this point; we should think the distinctive treatment the inevitable one in an architectural sense.

It was a special injunction also that the baths entrances should be so arranged that one pay-office would receive the fees from all four classes, first and second class of both sexes; an economising arrangement which, as we have before pointed out, renders the best arrangement and classification of the external entrances nearly impossible, though some competitors have cleverly contrived to reduce the disadvantages to a minimum. Mr. Hare, the author of the first-premiated design, places his large swimming-bath (which, it will be remembered, is also to be used as an assembly-room) at right-angles to the principal front, and the smaller swimming-bath butting against it parallel to the principal front. The first-class women's access to the swimming-bath is very well arranged, their entrance-corridor leading to a waiting-room which forms the access by one door to their own slipper-bath department, and by another door, to be kept closed ordinarily, to the swimming-bath. It was not easy to provide for this double use of the swimming-bath in a neat and easily workable manner; one or two of the competitors have blundered badly over it, and several have contrived it in a very clumsy manner. On the other hand, Mr. Hare's men's corridors are long and rather circuitous; and though his exits from the large bath when used as a hall are sufficient, the route from the hall doors to the street doors is rather complicated. This is a fault in many of the plans, but one or two have been very successful with this detail. Mr. Hare has used up his space very completely, and done without any open areas, but this has involved putting the lending-library, where less light is required, at the inside of the library site, and the reading-room at the outside, where there is more noise. He is right, however in keeping his reference-library on the upper floor and lending-library on the ground-floor, (there not being space for all the rooms on the ground-floor); the use of a reference-library is much more limited, in an ordinary public institution, than the use of the lending-library. The entrance to the lending-library is not as straightforward as it should be.

The principal elevation is treated as that of one building, and though a little what is sometimes called "fussy," it is on the whole the most pleasing one in the room, and probably had a good deal to do with the selection of the design. The heavy timber roof over the large bath we do not like, but it must be remembered that the bath was to serve a double purpose, and the roof may seem more suitable when the apartment is regarded as a meeting-hall. In fact, it is almost impossible to design an interior which shall look equally well as a swimming-bath and a meeting-hall; the treatment that suits the one does not suit the other.

The author of the second-premiated design

has apparently withdrawn his drawings from exhibition, as an expression of his feelings at not having received the first premium; a proceeding hardly either wise or dignified. In the third premiated design, by Messrs. Groll & Todd, the baths are arranged on the ground in the same way as in the first. The men's entrance to the first-class swimming-bath is very circuitous, but otherwise the entrances are well planned. The central pay-office is cleverly contrived so as to admit of keeping the men's and women's entrances quite distinct and separate, and the extra exits from the large bath are much straighter and more obvious than in the first premiated design. In the library department the lending library is upstairs, which is a mistake, but the doors and public counter to it are well arranged. The point to be looked to in the access to a lending library is that the public should approach it in a straight direction and not round corners, and that the counter and space for the public should be wide and shallow rather than deep and narrow and projecting into the library. Some of the plans are exceedingly bad in this respect, and would lead inevitably to perpetual jostling, as in number 26, where one door, reached at right-angles from the street entrance, gives access to one end of a long counter-space. There should be at least two doors, for exit and entry, and both in a symmetrical and central position with reference both to library and street entrance or hall. The exterior design in the third premiated set is very inferior to the first, though more pretentious; and the details are coarse. In fact, this set has got its position by plan, as we think the first did mainly by design, although there are very good points in the plan of the latter.

A few notes only can be given on the remaining designs, which are very badly exhibited, no trouble having been taken to render them all equally accessible, which is very unfair to those which are jammed together so that no one can get at them, though we presume that in all probability the best ones have been put in the most accessible places. Taking them in the order in which they were hung (the numbering did not follow in order) we may note that No. 23 is a design with some character, and the corridor access is well planned. No. 24 shows the entrances to the baths exceedingly well planned, the corridor routes being simple and obvious and the special women's access to the large swimming-bath well provided for. The approach to the lending library is better than in either the first or third premiated plans, being up broad steps facing the street and giving direct access to a long unencumbered counter space. The question has been raised by a correspondent in our columns whether it was necessary or right to have bestowed the separate premiums for library and bath designs—the Commissioners having retained the power to adopt and to premiate the designs for these two departments quite separately—on the same competitors in each class of premium, and whether there were not plans for either library or baths which, taken separately, were superior to one or other department as treated in the premiated designs; whether, in short, the premiums ought not to have been more divided. This plan certainly gives some point to the complaint. The exterior design is not very refined, but it is not without effectiveness and originality; it shows a large square mass over the baths entrance, crowned by a cupola.

In No. 34 the library block is very well planned, better perhaps than in any other plans we were able to examine. There is a good wide central entrance, the lending library and the reading-room are on opposite sides with their ends to the principal front, so that the noisy angle of the building is given to the lending library, and the reading-room is kept more within the building and top-lighted; the magazine, also top-lighted, is behind the entrance-hall, and in a quiet position. The reference library is upstairs,

which, as we have said, is much better than putting the lending library there. The baths plan is not nearly so good, and there is no proper provision for the women's approach to the swimming-bath. The elevation shows a good deal of character.

No. 1 shows an original though rather eccentric architectural treatment, in one symmetrical block with square angle towers with battering wall-lines, which are more easily put on a drawing than economically carried out. The baths entrance, with its two oval lobbies, is ingenious and effective, but the exits from the large bath, when used as a hall, are insufficient.

No. 6 is good in the planning of access to baths; here the second-class men's baths have an entirely separate street entrance round the corner, but the author has been unable to separate the two classes of women's entrances in the same way, which would perhaps be more desired. The access to the lending library is well planned. The exterior design is quiet and in good taste, but rather unnecessarily cut up into fragments.

No. 19 looks a good set of drawings, with a pleasing though very simple exterior treatment, but will not bear close examination; the baths entrances are not well planned, and the board-room opens out of the women's baths vestibule, an absurd arrangement.

No. 9 is a sensible-looking design architecturally; the entrances to baths are well arranged except the women's access to swimming-bath, which is provided for in rather an accidental kind of way. The library block is well planned. The long exit corridor from the back of the large bath and running along outside of it is of no use, as it only ends in the same lobby into which the people coming straight out from the nearer doors of the hall would be discharged.

No. 2 shows a pleasing design and a beautifully got-up set of plans, but has many faults of arrangement.

In No. 35 the lending library and its entrance are well planned, but the reference library above should have been at the back (for quiet) and the book-store in front. In the baths plan the women could not get access to the swimming-bath without going through the corridor of the men's slipper baths, a quite untenable proposition. No. 28 shows the eccentricity of separate street entrances for men and women, leading immediately into a vestibule common to both. It is no use to label doors "men's entrance," "women's entrance," unless the internal arrangements correspond.

No. 20 has an external design with a good deal of picturesque character; the baths are very well planned, the access to them perfectly simple in its lines, the women's access to swimming-bath very well managed, and there are ample and straight exit corridors from it when it is to be used for meetings. The library portion is also very well arranged, with the librarian's room on the ground floor communicating with lending library and newspaper room on opposite sides; the access to the library is rather throttled and the space for the public inside awkwardly cut into by the piers. The baths access and corridor plan is the best we have noticed among the plans.

We believe the competition has been most fairly conducted, but we do not feel the same confidence which we have been able to feel in some such cases, that the best plan has really been selected, and we doubt if any one plan combines the best treatment in both departments so decidedly as to justify the award of any two premiums to the same competitor. More justice would have been done if the premiums for library and baths had all been separately awarded.

NOTES.

THE Committee, consisting of Lord Kelvin, Mr. W. H. Preece, and Major Cardew, which was appointed to define the limit of a low-pressure supply for electric lighting, have reported to the Board of Trade.

They have recommended that if the conditions of the supply are such that the pressure can never at any time exceed 500 volts if continuous, or 250 volts if alternating, the supply should be considered low-pressure. They have also recommended that the limit of the pressure on a low-pressure supply at the consumers' terminals should be raised to 250 volts if continuous, or the equivalent thereof if alternating, provided that no change be made in the pressure of the supply to any consumer in consequence of the issue of these regulations without his consent. We are glad to see that a well-marked distinction has been made between direct and alternating current supply, a point on which we have always insisted, as at the recent Conference an attempt was made to place them on the same level. The report is certainly favourable to the electric lighting companies, and we think that the limit has been fixed at a higher value than the educated consumer will altogether appreciate. It is amusing to hear low-pressure electrical engineers declaring now that a pressure of 600 volts is quite safe; not so long ago they considered it deadly. It merely shows how easy it is to convince oneself when it is to one's interest to do so.

FROM the consumers' point of view, a 100-volt electric supply current is far preferable to a 200-volt supply. Anyone who has heard a fuse on a 200-volt circuit go off like a pistol shot needs little technical knowledge to understand that the danger of arcing across the terminals of cut-outs is far greater with the higher pressure. It depends now on the makers of electrical fittings and the wiremen to guard against this greatly-increased danger. Single pole cut-outs must never be used, and only the best flexible wire, and even then the insulation of flexible wire is but a poor protection from shock and short circuits after it has been in use for several years. The suggestion that the Board of Trade should give a provisional sanction to any three or five-wire supply company to earth the middle wire we hope will not be adopted. We have seen a workman light an arc lamp on a London public supply circuit by connecting one end to the gas-pipe instead of to the other main, his reason being that it burned more brightly when connected in this way. This is one of many cases we have come across of grown-up people experimenting either wilfully or out of ignorance with electric light fittings. Electrical engineers are hastening on too quickly in their agitation for higher pressures. In time, when people know more about electric supply, it may be safe to use higher pressures, but at present it most decidedly is not. A few accidents due to this cause would do far more harm to the industry than the expense of a few tons more copper in their mains.

A SHORT discussion took place at Tuesday's County Council meeting on the recommendation of the Main Drainage Committee to pass over the lowest tender for the supply of centrifugal pumps at the Heathwell Pumping Station, and to accept the fourth on the list. The Committee explained that the contractor whose tender was the lowest did not appear to have had much experience in the manufacture of centrifugal pumps, and, in fact, had only erected one, and that one "in Russia." The second lowest tender was informal, and the Committee were of opinion that they ought to accept the estimate by Messrs. Gwynne & Co., the original patentees of centrifugal pumps, whose tender was only 72% in excess of that by Mr. John Cochrane, who came third on the list. The report of the Committee gave two reasons which had influenced them in making this recommendation; that Messrs. Gwynne had had many years' experience in the manufacture of centrifugal pumps, and that they "are a London firm"; and it was

this last reason which principally gave rise to the attack which was made upon the Committee. It was said that the recommendation was an insidious attempt to introduce protection for London firms, and that the question was not merely one of 72*l*, but whether or not the Council cared to risk destroying the confidence of contractors in the good intentions of the Council. In the end the Committee's recommendation was agreed to, most of the members appearing satisfied with the explanation that the Committee had been alone animated with the desire to get the best pump. We are not surprised that exception should have been taken to the recommendation, and we are glad that members of the Committee repudiated any intention to limit the execution of the Council's work to London firms; to introduce Protection in this form would, in our opinion, have a seriously adverse effect upon both London work and London workmen. In regard to the action of the Committee in passing over the lowest tender there appears to be an opinion among many people that public bodies are bound to accept the lowest tender, and that notwithstanding the usual clause to the effect that they do not bind themselves to accept the lowest or any tender. The lowest is usually accepted, and rightly so, but where there is good reason for departing from the rule, it is simply a waste of time to call in question the justice of such departure.

COUNT BADENI, the new Austrian Prime Minister, and the Ministers for Commerce and Education, have received a deputation of the amalgamated societies of Austrian architects and civil engineers in reference to a number of important questions affecting the training, examination, registration, and privileges of the technical professions, the creation of new technical Attachés on the Foreign Embassies, and improved sanitary legislation. We cannot give space to describing all the various requests and schemes put before the Government, but it may be well to mention that this deputation of the technical professions was exceedingly well received, and that, according to our Vienna contemporary, the *Freie Presse*, the subjects broached will receive immediate and favourable consideration. The deputation included "Ober-Baurath" Prenninger, "Stadtbaudirector" Berger (the City Architect of Vienna), and Herr Ziffer, on behalf of the civil engineers. The amalgamated societies last met at Vienna in 1891, and can boast of a total membership of over five thousand. A standing committee or council permanently represents the body.

WHAT is the life of an iron railway bridge? This question formed the subject of a paper recently read before the American Society of Civil Engineers by Mr. J. E. Greiner, and, as might have been expected, it led to a long and interesting discussion, although no very definite decision was arrived at. If railway bridges have had to be renewed after only twenty-five years' service, as has often happened, it is not on account of their having failed, or worn out under the loads which they were designed to carry, but because these loads have been increased to such an extent that they became shaky and totally unfit for the much heavier traffic at greater speed now in use. The tendency for some time past has been to increase the weight of the rolling-stock on our railways, as occasion required, and this will no doubt continue so long as it is more economical to work a smaller number of heavier trains than a larger number of lighter ones. In designing bridges at the present day, therefore, it is very difficult for an engineer to decide how much he should assume the weights of the locomotives will be increased in the future, since this is a matter largely beyond his own control; and although it is his duty to save money in maintenance and construction, yet it is his

highest obligation to insure safety. Those who have questionable bridges to look after, and who are undecided as to what action should be taken, would do well, in cases of serious doubt, to give the travelling public, and not the bridge, the benefit. Iron is cheap when compared to human life.

AS we anticipated, Salisbury Cathedral tower will require more than was at first expected to make it secure; more nearly 10,000*l*, than 5,000*l*. It is satisfactory to learn that the result of Sir Arthur Blomfield's detailed examination of the tower is that it is safe for the present, against anything short of an earthquake.

FIVE sets of designs for artisans' dwellings have been sent for our inspection, the five placed first in a competition for the erection of a block of such dwellings proposed to be erected at Kentish Town, at the cost of a gentleman who wishes to do good without advertising himself, and whose name, at his own request, is not given. We understand that none of the designs sent in will be carried out as they stand, as none are considered entirely satisfactory; but five have been recognised as worth attention, and are placed in the following order of names:—(1) Mr. Harry Heathman (Bristol); (2) Mr. C. Pickford (London); (3) Messrs. Killick & Wood (London); (4) Mr. W. G. Lewton (Reading); and (5) Mr. Valentine L. Knight (Blackheath). The site is a parallelogram bounded on three sides by straight lines, the fourth boundary, at one end, being irregular in shape: the principal front facing Highgate-road. The author of the set marked No. 1 was placed first (and rightly) for having adopted a plan carrying the buildings round three sides only of the ground, leaving an open side towards Highgate-road, and also as managing the working of the plan with fewer staircases than the others; Nos. 2 and 3 as being the two best following a usual type of plan of artisans' dwellings, with two parallel blocks and a space between; No. 4 for his special arrangement of a boarding-house for unmarried clerks forming part of the scheme, which is a good feature and is well arranged; No. 5 for the best arrangement of the club premises which form part of the scheme. All the sets show in the main a very creditable attempt to deal with the site, but one or two of them have serious drawbacks in detail which seem to have escaped the notice of designers and client. In No. 1, which in the main arrangement is no doubt the best of the five, there are several dwellings shown on the ground plan, and which would be repeated on the upper stories, in which the water-closet opens direct out of the scullery; these are the minority of the dwellings, but the arrangement is most objectionable. In No. 2 the kitchens would be almost entirely without light to the fireplace, and in the main we should consider No. 3 the much better arranged. In No. 4 a praiseworthy attempt has been made to make a small bath-room a feature in artisans' dwellings; this is seldom or never attempted, but it is a most desirable innovation, especially where men are employed on trades in which they cannot avoid getting dirty in the ordinary course of their work. We should be very glad to see this taken as a precedent, wherever it can be economically possible. No. 5 also introduces bath-rooms, but in a separate house, divided for men and women. The plan is rather wasteful of space, and the range of coal-cellars (also placed separate) much too large for the requirements of such houses. We shall be interested to know what is the final result of this well-intended effort.

A TOUR has been arranged by the Architectural Association to Greece, which gives promise of being a very successful one. The party will start on the 16th inst. and will be away for twenty-four days; while the cost to the members of the party will be

exceedingly reasonable. Communications on the subject, by those intending to take part in the tour, should be addressed to Mr. Hugh Stannus.

THE work by the Editor of this journal, published about six months ago under the title "Architecture for General Readers," will be re-issued shortly by Messrs. Chapman & Hall in a double second edition, one for England and one for America, the latter being taken over by Messrs. Scribner.

A FEW of the lithographs by Mr. Whistler exhibited at the Fine-Art Society's Gallery have a certain charm and interest; including nearly all those in which the figure is the principal subject, such as "The Little Model Reading" (3) "The Sisters" (61), and some others; and some of those which represent nooks and corners of street-scenes are effective, though there is nothing very remarkable about them. A large proportion of the exhibits, however, are rough scribbly sketches of a bit of a house, sometimes only a window or two, which are of no value in any sense, except such market value as may attach to them from the artist's name, so long as people are silly enough to take everything Mr. Whistler does at his own valuation. To see such a scrawl as the one facetiously labelled "Hôtel Colbert, Paris" (40), priced in the catalogue at two guineas for an impression of it, is a curious indication of what it is supposed that the public will swallow. We should be sorry to give two shillings for it; but people who are foolish enough to be caught by this kind of pretence deserve to lose their money.

THE meeting last Saturday at St. Albans, at which the parishioners of St. Peter's joined in expressing their thanks to Lord Grimthorpe for restoring their church, had its amusing points. The principal speaker mentioned that Lord Grimthorpe, when offering to restore the church, had stipulated that there was to be no committee—in other words that he was to do exactly what he liked—and said that in the case of any one else this proposal would have been seriously considered, but that "after the magnificent work his Lordship had done at the Abbey" the proposal was accepted without hesitation: a conclusion highly characteristic of the typical attitude of the British Philistine on such subjects. Lord Grimthorpe has made himself a laughing-stock and the unfortunate cathedral of St. Albans a monstrosity by the bungling architecture with which he has deformed it; accordingly he is a fit man to be given entirely irresponsible charge of any other building where he likes to pay for the privilege of posing as an architect.

STUDENTS' DRAWINGS AT THE ROYAL ACADEMY.

THE exhibition of students' work for the various prizes given by the Royal Academy cannot be said to be above the average, and considering that this is a "Gold Medal Year," the drawings are somewhat disappointing. In architecture the Travelling Studentship is awarded to Mr. Pieter Rodeck for a design for a large town church, its plan based on that of a Greek cross. The design is in a severe style, with Byzantine detail, and no doubt has gained the prize partly on account of the way the form of the Greek cross has been adhered to on plan. In many other respects, we must own a preference for one of the unsuccessful designs—a treatment of Renaissance simple and effective, with central dome, and four half domes over the arms of the cross. Mr. Rodeck's perspective is hardly satisfactory, and has been taken from a point which has the effect of unduly stilted the upper portion of the design. A third design is of a more elaborate nature, and gives many evidences of a study of St. Paul's Cathedral. But the outline of the dome is obviously too squat—from the ground a great deal of it would be lost.

Nine designs have been submitted for the

planning of a club-house—that by Mr. W. E. Brown being awarded the prize. He has, however, crowded four tables into the billiard-room, allowing only 6 ft. between them, and although evidently made so for the sake of symmetry, the committee-room on the ground floor and the card-room over it are too large. Design No. 8 is in many respects one of the best working plans. It provides a visitors' reception-room, leading out of the vestibule, and the staircase hall is well screened off, with the principal club-rooms leading from it, the library and billiard-room being placed behind, where quiet would be better obtained. We should have placed the library on the ground floor, and the billiard-room over it, where it could have had a top light, and have been within easy access from the dining and smoking rooms. A large area is provided at the back. The other plans do not call for special notice. Mr. Peter Kodeck, the Travelling Student, has also been awarded the 10th prize for a set of drawings of an architectural design—a strange-looking tower, possibly clever, but certainly not beautiful. Mr. George Weald wins the 25th prize for a set of architectural designs.

The subject set for the Silver Medals was the Horse Guards, and many will be glad to see a set of measured drawings of this interesting building—a public building erected at a time before the value of breadth in designing a large building had given place to the fussy elaboration of much of our present-day work. Both first and second prize drawings, by Mr. Archibald Christie and Mr. Wm. Hawke respectively, are carefully drawn, the latter having, however, given more details than the former. The drawings made by the Travelling Student elected in 1895, Mr. James Stewart, are an interesting series, comprising pen sketches, pencil and crayon work, and some water-colours. The subjects are from Italy, France and Spain, and amongst the best are a measured drawing of pulpit at Ravello Cathedral, the Alcazar, Toledo, a front from Salamanca, the façade of the Theatre of S. Carlo at Naples, a portion of a pavement from Siena, as well as two drawings of an interior and porch of the cathedral, an interior at S. Peter's, Rome, the beautiful tomb of Leonardo Bruni, at S. Croce, Florence, and water-colours of a gateway at the Alhambra, an oriel and churches of S. Etienne, and S. Gilles at Caen. Nearly every drawing, however, bears evidence of careful study.

No less than fourteen designs have been submitted for the prize of 40^l. given for a design for decoration of a Public Building, but the selected design by Mr. Harold E. Speed is in every way so far in advance of the others, that the judge's work must have been easy. "Autumn" is the subject given—"Spring and Summer" having been given in former years—and we understand that the design is to be executed by the artist. Of the other prizes Mr. E. H. Reed wins the Creswick, the subject being "The Bole and Roots of a Beech Tree," Mr. H. R. Mileham is awarded the Travelling Studentship for his painting of the "Finding of Moses," and the Landscape prize falls to Mr. C. R. Burnett. A Silver Medal is awarded to Mr. F. D. Wood for a design for a medal to commemorate the Institution of the Order of the Garter, the obverse having a bust of King Edward III., and the reverse St. George and the Dragon with marginal inscriptions—all excellently designed. For the Composition in Sculpture, the Travelling Studentship and Gold Medal is given to Mr. Francis D. Wood for a very beautiful and refined group representing "Dædalus and Icarus."

THE ARCHITECTURAL ASSOCIATION: SCENIC ART.

THE fourth ordinary meeting of the present Session of this Association was held on the 6th inst. in the Meeting-room of the Royal Institute of British Architects, Mr. W. D. Caröe, M.A., F.S.A. (President) in the chair.

The following gentlemen were elected members, viz., Messrs. C. M. Berrington, H. E. Davey, and J. M. Western.

The President said he had been asked to state that a very promising tour had been arranged to Greece on December 16, lasting twenty-four days. If any of the members wished to take part in this tour, which was an exceedingly reasonable one in price, he would ask them to communicate with Mr. Stannus. He had also to announce that the lecture on Special History, Division II., by Mr. Farrow, would commence on the 16th inst., and that on Elementary Construction, Division I., by the same gentleman, on the 18th inst.

The President further announced that the Committee had decided to open the handicraft classes in connexion with the Trades Technical Schools to all the students, irrespective of their belonging to the Class of Design or not.

Professor Herkomer, A.R.A., then read the following paper on "Scenic Art"—

You will agree that there is some danger in encouraging an enthusiast to speak of an art in which he is but slowly feeling his way by means of experiment, for he is sure to see possibilities in his own mind that cannot be manifested to others except by demonstration.

When I was in the full swing of my experiments, many absurd motives were imputed to me by the over-indulgent public, who have witnessed and encouraged my efforts in stage-work; of these the most fallacious was my supposed desire to reform the scenic art of the times. Surely, when an artist, who has sternly suppressed the craving for stage-work during twenty years, at last is able to build a theatre of his own in which to make experiments, it is hard that he cannot do things his own way without at once being made to pose as a reformer. I will frankly give you my thoughts and reflections on scenic art, but although I shall suggest many changes, I want you to understand that I am but a worker, and not a reformer in this field of art.

The questions for consideration are: firstly, "The auditorium"; secondly, "Realism on the stage"; thirdly, "The lighting of the stage."

As the very word theatre means "a place for seeing," we must first consider how it is that it has become so much a place for "partial seeing." Practically, the means at the command of the modern scenic artist are unlimited in their range and possibilities. But unless some serious changes are made in the construction of the auditorium, the scenic artist will never have his work properly seen.

There is a strange innate conservatism in man that causes him to repeat a model once established, and with almost Stoic indifference to the exigencies of the age. Thus it is that the semi-circular-shaped auditorium of the present day theatre, which sometimes forms a complete circle, like a deep well, has as its prototype the first great Dionysiac theatre, built 340 B.C., with its auditorium scooped out of the rock. The Roman theatres were copied mainly from the Greek originals, but were built on level sites, and not scooped out of rock. There was even a double theatre built in 50 B.C., "which revolved on pivots so that the two together could form an amphitheatre in the afternoon after having been used as two separate theatres in the morning." In the Roman theatre the "orchestra," which was occupied by senators and people of rank, would correspond practically to our present stalls and pit.

There was a change in the well-like shape of the theatre in the Middle Ages, when the miracle plays were given. This was owing to the temporary homes needed by the strolling players. Either they were performed in churches, or tents, or wooden sheds, or courtyards of inns—the latter, especially in the time of Elizabeth, under the management of Shakespeare and that carpenter Burbage. What the first building erected by Burbage in London in 1576 for dramatic purposes was like I cannot say, but no doubt some illustrations exist. It is, however, certain that the deep "well-shaped theatre" has been bred into our natures for many hundreds of years, and will take some time to breed out. All the inconveniences are overlooked or are considered essential parts of the proceedings—at all events, when people are in such a building they really feel that they are in a theatre. On the same principle, hundreds of people who never enter a theatre on principle, will witness a play enacted by German Reed's company, because St. George's Hall, in which the performance takes place, does not look like a theatre, and their consciences therefore sit at rest. But for the real *habitus* of the play-house any new distribution of seats would be heresy, and it is this personage that the manager fears and bows to, hence a dead-lock in the construction of theatres.

No doubt for economical reasons the builders of theatres have been compelled to adhere to the old form of auditorium, which is, as I have said, nothing more nor less than a great well. I am fully aware that the form of auditorium in Wagner's theatre at Bayreuth (which to me is the only correct form) is not easy to carry out in a city like London or Paris. Still, I believe a modification of this principle is possible, and that some form of auditorium with an entirely new method of distributing the seats could be invented

without encroaching too much upon ground space, and at the same time without reducing the number of seats required to make the theatre pay. Here is a chance for the budding architect! In any case the principle should be to provide seats from which the full intention of both actor and scenic artist can be perfectly seen by the audience. I take it that an actor should study his actions as much as his tone of voice, and that in many cases his meaning should be made clear to his audience by his movements alone. But how is it possible to make his movements convey, at the same time, the right meaning to the person who sits 30 ft. or 40 ft. above him and the person who sits lower than his feet? Now, it will be readily understood that the point of view from which a plastic picture is seen is of even greater importance to the scenic artist than it is to the actor, yet, under existing circumstances, it is impossible for him to make his stage-picture look right to every person seated high and low in this great well.

When judging the pictures in the Royal Academy for the annual exhibition we sit in a semi-circle, and the pictures are held opposite the President, who sits in the centre. I have noticed that the Academician who sits nearer the centre finds much less fault with the drawing in the pictures than the Academician who sits at the end of the semi-circle; and for obvious reasons. In our studio, again, we carefully raise our picture on the easel to the proper height before showing it, and studiously place the chair in front of the picture for the spectator, as we believe the entire effect of our picture to be lost if the eye cannot rest somewhere near the actual point of sight in the composition.

The reasonable placing of the spectator before a plastic stage-picture is of equal importance, and I must perforce consider the imperfect seeing of the scenic artist's work as a serious, perplexing, as well as an unfair tax upon his art.

Having so far touched an initial flaw in the construction of the auditorium, we will pass on to the actual scenic work of the stage.

Of course there are people who think all scenic display is hostile to the drama. But the dramatic and pictorial are to my mind inseparable factors in a stage play; therefore I could not be happy with Shakespeare in a barn. And although a bad play or a badly acted play cannot be saved by the mere excellence of its scenic mounting, a good play and good acting is most assuredly enhanced by this (to me) indispensable auxiliary. But now we come upon that most misconstrued word "realism." I might as well clear the ground by saying that positive realism on the stage is an impossibility. Let me explain.

Natural phenomena must always be expressed through an art, and that art is applied by a human being whose idiosyncrasy leaves its mark on every effort. Therefore the aspect of reality is by no means always attained by actuality on the stage, because the very foundation of scenic art is artificiality. Further, it is through the management of light that we touch the real magic of the art. Hence it follows that open-air plays can never be satisfactory. The actuality of nature and the artificiality of the actor's situation can never blend; nor is the light under control of the magician whose especial privilege it is to take you into a world of his own making. It is through his craft that he makes you realise nature, and it is through artificiality that his craft becomes expressive.

Many people who witnessed one of my plays took it for granted that I had opened out the background so as to bring actual nature into the line of sight, for to them the distance looked too real to have been artificially produced. After the performance I allowed them to come on the stage to see by what means I had obtained the illusion, and it was curious to note the tendency to resent the "trick" whereby their eyes were deceived. Some may even have doubted my honesty, and may have gone away with the idea that I did not show them the real method while they were on the stage. But they hardly realised how, through the management of lights, the strangest deception can be practised upon our visual organs.

By means of absolute control of the lights, we arrive at mystery, and without mystery the very backbone of scenic art would be broken.

It is this want of mystery, through the presence of daylight, that caused the Oberammergau "Passion Play" to appear so unnatural to me—I use the word "unnatural" advisedly.

The real secret of perfect scenic art lies in illusion—in deception—in not allowing the eye of the spectator to see the means whereby the semblance of reality is obtained. Mere actuality does not accomplish this any more than

simple good painting. It is in the attempt to get every requisite effect by painting that so much mystery is lost on the stage, for the scenic-artist's art should be as much hidden as that of the actor. We should not require to know whether a background is painted or modelled, any more than we should trouble ourselves to know whether an actor is "made up," or appears in his natural form. We ask that he shall look the character that he is portraying. Just so ought we to desire that his background shall be artistically right. I plead that the "make up" (as it were) of the background should be held to be of equal importance with the actor's personal "make up." If you dispense with the one, you might as well dispense with the other. Indeed, if you accept a rose bush cut out of thin boards, the edges of which you can hold between your thumb and first finger, or a street-scene painted on canvas and hung across the stage upon which shadows of the passing actors are thrown from the foot-lights—a sheet that is moved like a sail by every draught of the stage—you ought in truth to accept an actor whose wig has been so badly put on, that his own black hair shows underneath the artificial bald head. The latter would never be accepted by the public, but the former are seldom questioned.

It is amazing to me how an audience that is only too ready to howl down the slightest inconsistency in the characters acted on the stage, will meekly accept the grossest inconsistencies in their scenic surroundings. The jutter absence of mystery, the barefaced childish neglect of truth to nature never disturbs them—so few people, alas! have looked at nature; hence the impurity behind the proscenium. But all this is not right.

I hold the stage to be the medium through which the greatest truths in nature can be brought home most directly to the minds and hearts of the people, and all the arts can, to their fullest capacity, be united in this most complete form of human expression. But we should not be satisfied until all the arts are played on an equal footing, not necessarily of importance but perfection.

Let this be clearly understood; instead of swamping the actor by the scenic art, the perfection hinted at here would quite as often mean the entire subjection of scenic art to the importance of the actor at certain moments.

Although the one branch, scenic art, that I am now treating of, has improved, the improvement has been unsolicited from without. But that is naturally a slow process. Wait until your audiences howl down a ridiculous stage moon, and you will soon mend that luminary. It is quite safe at present to let your moon rise perpendicularly up the sky, very quickly, until the mechanism is exhausted, and then let it stop. Further, that the moment this red, rising moon appears over the horizon, it shall send rays of blue light from the opposite direction from which it rose. It is safe to let down a "wobbly" sheet of canvas, also close to the foot-lights, with a scene painted thereon representing breakers dashing over the cliffs, and perhaps a sinking ship in the distance, to which the actor may have to refer in his speech. It is safe to have layers of canvas hanging from the "sky," like so much washing hung on a line; and certainly nobody ever questioned the prerogative of the "Firmament" coming together at right-angles in the corners.

Now, I rejoice whenever I see a noble effort to bring about an "artistic whole" on the stage, notably from the hands of that great artist, Sir Henry Irving, who, with a giant's strength, carries through schemes that would crush any other actor or manager. I suspect there is but one master-mind behind the Lyceum proscenium, and that is the secret of all success. If a thousand people are needed to carry out an art scheme, it must be planned and directed by the one man who stamps it as his work.

Still, scenic work, as we see it, even at its best, is still more or less on old lines, and on those old lines the greatest capabilities of the art cannot be reached.

You may ask, if mere good painting on the stage will not give you the best result, what will? My answer is: There is no law to guide you; use whatever contrivance gives you the best effect. Through the witchery of the light do we get at the semblance of nature on the stage, and often the most trusty materials, when properly illuminated, will beat the most skillful touch of the painter. Therefore the scenic artist must be a born experimenter, with the faculty of seizing the artistic accident. He must be an inventor of ways and means; must be of an imaginative as well as a practical turn of mind; strong in body and indefatigable in his energy, and with a first-rate artist. Rather a "large order"! But it is

to this scenic artist that the actor should look for the completion of his dramatic situation. Although the interest is more centred upon the actor than upon his scenic surroundings, I would go so far as to say that many a dramatic situation has been weakened on the stage (although the spectator could not perhaps define the reason) by the "mood," or, as the Germans say, "*Stimmung*," of the scene being out of harmony with the rest of the actor's situation.

It is this mood or aspect of a scene that should, to my thinking, reflect that of the actor, or else strengthen it by the force of contrast.

Just as an atmospheric effect, or a scene in nature, produces that indefinable condition of the mind that we call a "mood," so ought a scenic effect on the stage to impress itself on the mind of the spectator by its poetic and picturesque fitness.

To produce this magical effect the question of lighting is perhaps the most momentous, as the best design and the most artistic work can be utterly ruined by the improper application of the light.

I fancy that there have been but few changes made in the system of lighting the stage since the introduction of gas. Electric light is only supplanting gas, with little, if any, departure from the same system of applying it.

It is strange that tradition sticks to the stage more than to any other form of art, resulting, as it does, in habits of thought to which we trace the origin of fashions, of manners, of mannerisms, and of blindness. But I would not sweep away tradition any more than I would allow it to cripple originality, if it were sincere, for such originality would emanate from minds that have not striven for mere novelty. But so overwhelming in their magnitude are the demands made upon both scenic artist and stage-manager, to which must be added the maddening limitation of time for all their efforts, that they naturally resort to tradition in order to save their very lives. By avoiding all experiments the scenic artist at least retains the serene "mood" of the stage-carpenter, whose habits of thought are stereotyped, to put it no more strongly.

But without experiment, fresh with every piece and every design, there would be no more chance for the scenic artist wholly to break loose from the bondage of tradition than it would be possible for an author to produce original plays if he had to write for the same company year after year.

Now, I cannot but wonder that results on the stage are successful at all, considering how divided are the elements at work upon scenes that should have, as I have said, the stamp of one mind—either that of the stage-manager or that of the author. The "limelight artist" is as far removed from the contriver of the mechanical devices as the scene-painter is from the stage or acting-manager. And all the difficulties are as much a sealed book to the public as well, as an orchestral score. Therefore, in criticising the present methods of lighting, I wish in no way to undervalue the enormous difficulties that beset author, manager, and scene-painter in their attempts to please a mysteriously-constituted public. But there are so many pieces placed on the stage now with every preparation for a long run, that I maintain that some radical changes could be made, not only with advantage, but with ease, especially in the matter of lighting the stage. In view of this, I will first attack the sacred footlights.

I take it that footlights are simply the survival of a period in which lights had to be given with but poor material. And a nice commotion there was when the candle-period had to give way to the lamp system (because the actors considered the stumps of the candles as their perquisites), and again when the lamp system was swept away by gas. Footlights are convenient, but they are chiefly to blame for the false and unnatural aspect of the stage, to which, I fear, the public have become so accustomed that they almost prefer it to anything more closely resembling Nature. Lately in Munich (where scenic art is by no means at its worst), at one of their good theatres I saw an interior lighted up entirely by the footlights, which caused the top of the table to be absolutely dark, so that the poor actors could not see to eat without putting their noses down into the plates.

But what are we to do without footlights? We all know that the lights from within the proscenium alone cause heavy shadows on the faces of the actors as they approach the front of the stage, and that these shadows must be relieved by some lights in front of the proscenium. But where to place them? Nobody will be rash enough to say that light ever came from the ground in nature. Therefore to place lights on

the ground, under the noses of the actors, cannot but destroy all chances of obtaining truthfully the aspect of nature on the stage. If footlights were only becoming to the actors one might put up with the unnatural effect they produce. But here again the verdict must be against them.

In my first little experiment at Bushey I had fully intended to introduce footlights, but time was getting short and the effect was so good without them that I simply left them out. A great virtue was made of this by my kind critics. Now, to be credited with a virtue of which one was unconscious makes one think very kindly of one's self, and I was not long before I worked this accident into a theory. The year after, in my pictorial music-play, "*An Idyl*," I found the shadows on the faces of the actors could be perfectly softened by the group of lights I had placed on each side of the auditorium, about 10 ft. from the proscenium, and raised to about the height of the actor's face. These lights I afterwards "boxed up," so that they were perfectly hidden from the audience, and only gave their light to the stage. I may safely say that the effect I produced with this aid was, to the judgment of a painter's eye, as nearly as possible that of open daylight. I naturally now allude to the painter who aims at truth in nature, for we have in pictorial art the same incongruities that I complain of in modern stage-work. We have portraits (eye, and by great painters) representing a strong studio light on the face of the sitter, casting its heavy shadows under the nose, chin, and eyes, with a landscape in the background including a setting sun, or even with an additional effect of moonlight higher up on the canvas. In speaking of daylight, I do not mean necessarily sunlight, for that is much easier to represent on the stage than the diffused light of day when the sun may be hidden by light clouds—an effect that was probably first well rendered in our times by Frederick Walker, that master to whom we owe a true Renaissance in English art.

But if anyone wishes to gauge this effect of nature by mechanical means, let him look through a camera obscura, and Walker's art will be immediately suggested to him. Therefore I rather aim at getting the effect of diffused light of day, and to leaving sunlight for special scenes.

To produce this the lights that I have described would be most serviceable, and could be adopted in nearly all the larger theatres. Their illuminating power and height from the ground would have to be adjusted to the requirements of each stage by careful experiments. As they are electric, they can be reduced in strength, or their colours changed with the greatest ease from behind the proscenium. Limelight from the dress-circle in no way takes the place of these lights. I saw this method in America, and felt it to be a failure. Thus, when the musical conductor and orchestra are sunk below the eye-line, the spectator should be impressed with a new and delightful sensation, that of being able to look right into the stage-picture without any object to intervene and irritate. Now the foreground of a stage-picture should be treated with the same care and knowledge that a painter treats the foreground of his picture. But, unless the footlights are abolished, the scenic artist's foregrounds can never be the beginnings of his stage-pictures. The fact is, instead of their being a help to him, he has perpetually to work against them.

Before passing further into the stage-picture I am anxious to pause and consider its frame, or, in other words, the proscenium.

I take it that the proscenium should be to the stage-picture what the frame is to the easel-picture. It should separate the picture from the surroundings. But the stage-picture, just as the painted picture, should in that case reach the frame. In most cases the proscenium is built so high that a considerable space has to be covered with curtains to make the opening in any manageable. Why is this so persistently done?

The architect will tell you something about its giving dignity to the proportions of the house, or tell you—which I suspect to be the real reason—that it is customary to build them in this way. And so, year after year, theatres are built without inquiring what may be the real function of the proscenium.

How funny it would be to send a picture to the Academy in a frame that was a foot too high for the picture, having the vacant space modestly covered with a bit of "Liberty silk." But is not the other just as ridiculous?

Now let us suppose a proscenium to be built according to the necessities of its function—namely, to enclose the whole stage-picture. Is this all that is required? No! for I have still a further change to suggest.

I suggest that the proscenium be made to contract and expand. And for this reason: Every good artist knows that the size of the canvas upon which he represents his subject has as much to do with the success of the work as the proper placing of the subject within that space. On the stage, however, with a fixed proscenium, the poor man's cottage, or the garret, have to be represented of the same size as a palace; a corridor in a castle wherein much plotting is done (generally by two people) must be of the same size of the banqueting-hall. Or a house is first represented, and then a room in that house—which room is much larger than the house. Thus the eye of the spectator is never properly prepared for the great climax scene, because the trivial incidents leading up to it have been represented on such a large and disproportionate scale. This contracting proscenium is in no way difficult to make, or to apply to theatres already built, and ought to be workable by one man. There are so many incidents in plays that come to one's mind in which only two or three actors appear on a scene requiring no depth that such a contrivance would be an inestimable boon to the scenic artist. But beyond this I look to the very foundation of composition in art, which, for the balance of the whole, requires not only the most careful consideration of parts, but demands that the human figure shall be made duly prominent. The scenic artist, by the aid of this contracting proscenium, could, with the collaboration of the stage and acting-managers, carry out all the laws that govern pictorial composition in art. There need be no fear that the occupants of the lower side boxes would see less than they do now, when the action happens to take place on their side. And as for the higher side-boxes—let them perish! In my model here, I work it simply with a left-handed and right-handed screw, thus enabling one man to make the sides of the proscenium come closer together. The upper part is arranged for a counter-weight action.

And now let us at least raise the curtain (to open from the centre, if you please), and take the stage and the making of the plastic picture into consideration.

The subject is so vast that I hardly know where to begin, especially as I hold the opinion, already hinted at, that the scenic artist can do his work but imperfectly without knowing the intentions of the scenic artist and acting managers. Indeed it is hard for me to separate these three personages. Stage work is done, I know, and with marvellous results, with the author, stage-manager, acting-manager, machinist, and many more, all working in separate grooves, but such methods are mysteries to me. I have no right to address you on scenic art if you expect me to have been brought up in that school. On the other hand, I do not despair of being able to set you thinking from my standpoint.

However small my efforts in scenic art may have hitherto been, they have emanated from the inner consciousness of a painter; and I have a shy feeling, not unmixed with obstinacy, that I am on the right track for the scenic art of the future. Then I am bound to say that I have been favoured in many ways at Buxley for such experiment; first and foremost, in having nobody to give me advice; further, in having nobody to please but myself, there being no commercial element in my theatrical proceedings; again, in having men to work out my ideas who have had no training in stage work; and finally, in having a small and carefully selected audience who come by invitation predisposed to like what they see.

And so my whole efforts in stage work have been to realise a painter's view of nature, and that to the fullest. To accomplish this, it was necessary to include more than the mere lighting of the stage or the design of the scene—it had to embrace the very actions and movements of the actors.

That our pictorial methods of treating dramatic situations on canvas find favour with actors is shown in the fact that they frequently take hints from such works. I think the painters have hardly found the stage a fountain of inspiration for their art. Why, the very word "theatrical" is used as an expression of opprobrium when applied to a work of art. This again is not as it should be. The stage picture should call forth the highest powers of the painter. True, it is as perishable as the actor's art; but does the actor strive to make his art the less great because it perishes with him? Again, you may say it is an art of deception, and not of real merit, depending as it does on endless contrivances. But surely pictorial art is but another form of deception! In our art the painting of atmospheric effects and the rendering of luminous bodies

are only accomplished by dint of endless "dodging" with paint.

Scenic art should in no way be held an inferior art, just as little as decorative art should be held secondary to the art of picture-making. I go further and say the greatest painters of the day should find some pleasure in such work, if only out of pure revenge for the inadequacy of our paints and canvases to reach some of the rare effects in nature. All art is a struggle with the inadequacy of our materials for expression. But in stage work the artist has more materials at his command than in any other form of artistic expression—that is, when tradition and conventionality shall entirely give way to the intellectual "grip" of the painter who devises and carries out the scene. Therefore, in urging pictorial consistency on the stage, I wish to see the presentment of nature as it is understood and appreciated by the painter's mind. You will have as many varieties of such appreciation of nature as there are men practising art. But all the better for the art of the stage, for such work would at least be stamped by the idiosyncrasy of the painter (who is a student of nature) rather than by the tyranny of tradition. This tyranny has declared it necessary for the actor's face to be lighted up at all hazards. Therefore moonbeams have to follow the actors round the stage; and I make bold to say that should two actors of prominence be on the stage at the same time, they would each have a moonbeam. Alas! for pictorial consistency. When the scenic artist has such pranks played with his work he may well despair. Why, in the name of sense and art, can't the actor get into the fixed rays of the moon when he wants his face seen? I should have thought voice and the action of the body, however indistinctly seen, would be fifty times more impressive than the traditional method, which is, after all, nothing more than a confession of weakness. Nor need the darkness be overpowering to be true. Let that be guided by the painter's art. Am I now arbitrary? Perhaps; and yet I firmly believe every important moment in an actor's part (when it should be absolutely necessary to see his face plainly), could be so arranged that light of some justifiable kind could be brought to play upon his face.

Now for some of the scenic artist's methods. Hearing that I was going to give a lecture on scenic art, a friend of mine remarked to me, "Oh, then you will tell us some of your methods." This remark had a curious effect upon me—for I immediately asked myself the question, Have I any methods? I have the one important method certainly, of going on experimenting until I get the effect I want. But I have not thought of the ways and means by which I obtained the results as methods; I should find it just as hard to say what were my actual methods in painting a portrait. Perhaps after a few more years of experimenting, I might be tempted to write a handbook on scenic art, just as we have hand-books on every imaginable subject. But the joy of my work would then be gone, as I should know too much. The great joy I now have in such work lies in the excitement of experiment. No doubt I get, as do all successful workers, instinctive feelings of how the desired end can be gained, and it was in this way that I came upon the idea of slightly modelling the distance, and of placing a great sheet of gauze in front of and away from the painted sky.

The effect, as I reflected, with which I have to open the scene (let us say of my music play, "An Idyl") is towards evening. The work in the smoky ceases soon after the rising of the curtain, and the old people sitting outside their houses sing their evening song.

Before the reapers return, the great harvest moon must appear over the distant hills, soft and warm in colour in the pink sky—an effect in nature that deeply moves every imaginative painter, and which has been most nobly rendered by the painter, George Mason. With but little hastening of nature's time, the forty minutes of the act would be long enough to represent the last rays of the sun, casting the long shadows from the different objects on the distant slopes—time enough for the land to darken into that bewitching colour which is to be seen between the time of the setting of the sun and the rising of the moon. Then for the moon to increase in strength as it rises (correctly) into the sky, showing a halo of ever-increasing brilliancy as the whole scene darkens almost into night, when the curtain must shut off the picture from the eye of the spectator.

Now, I reasoned that a painted sky could not be changed in colour, and a painted distance could not first give me the long shadows and

then the absence of all shadows. The other alternative immediately presented itself to me—of making the distance in relief strongly enough modelled to catch the light and cast the shadows.

I came upon this as a natural inheritance, for my grandfather had already done the same thing, not for the stage, but for the church. He was by trade a mason, and by nature an inventor of the first order. His opportunities for the display of his inventive faculties were most limited, having had, from an early age, the care of the little farm property. But his artistic instincts were so strong that he set to work with his boys to make those little pictures in relief of figures, with complete backgrounds, that we still see in the churches of Southern Germany. The "Nativity" was a favourite subject. Hands and faces of the figures were carved in wood, and the draperies made of real material dipped in glue, which stiffened when dry. Trees were modelled partly with natural twigs and partly with mosses, and rocks and banks were all built up and coloured afterwards. In my boyhood, standing at the bench of my beloved father, I made many such pictures in relief, but my subjects were purely of a romantic character. I made forests with distant mountains to shut them in, and I carved the animals and I carved the hunters. Therefore modelling the distance in my play was simply to carry out the work begun and practised two generations before me. This modelled surface, properly lighted, appeared from the auditorium almost stereoscopic in its reality. For this modelling I used a mixture of plaster of Paris, glue, and stamped paper, sometimes adding tow. Then local colour was given with the ordinary tempera colours. Let me now for a moment leave the background and speak of the sky.

The sky was shut off by the houses to the right and left of the stage. This made it easy for me to stretch the gauze across the stage. From the backs of the houses I could play various lightmights upon the front of the gauze surface which started from behind the hills in the distance, and, therefore, was free from it.

It was made to lean forwards, so as to give opportunities for throwing lights upon the canvas of the painted sky which was behind it, and close up to the wall. This gauze produced an atmospheric effect far removed from the ordinary painted sky. No form of painting could have rendered the various tones of the sky so truthfully, no pigment could have equalled the colour I obtained by the illumination of the gauze by the lights passed through coloured glasses.

This surface of gauze is a perfect foundation for nature's grey in skies, that subtle tone which baffles us so much in painting; it is also a foundation for a soft blue, when the painted sky behind it is lighted up. With such a foundation of tones, which are not produced by means of a pigment on a flat surface, wonderful atmospheric effects can be obtained. As forms can be thrown upon the gauze surface by means of lanterns, clouds can be made to chase each other across the sky. From sunrise to sunset, from storm to calm, all sky effects can be produced with a mystery, and with truth to nature, utterly denied to brush alone.

Having space on both sides of the gauze, the surface can be used as a transparent medium, to soften harsh colours, or as an opaque surface upon which colour and form can be thrown from the front. I see endless possibilities for startling work with this material—I see a possibility of bringing living people within the focus of a lantern so constructed that they shall be reflected back on to the gauze surface, and again be repeated innumerable times until the heavens would live with spiritual figures. If life were only not so short; if money were only more plentiful for such experiments; if somebody else would only do my painting work; I would produce a fairy phantasy such as man has only seen in his dreams.

And these are some of my dreams when I lie awake at night, for the love of stage-work lies deep down in my soul, a gift, no doubt, from my father, who, with his brothers and sisters, were all Passion Players, for that play is still performed in our native village in Germany every ten years since 1808, a village with its present 1,000 inhabitants, which boasts of a theatre costing them 600*l.* to build; but forgive me, I had forgotten, scenic art is my theme.

Now this atmospheric gauze sky is no dream. If I were building a new theatre in London I would arrange a gigantic gauze screen to be brought up out of the bowels of the theatre after the scene was set, and the principle of adjustment should be similar to that on breakfast dishes, whose covers turn back on a hinge and finally settle underneath. None but electric light, of

course, must be used near the gauze, and all the limelights must be carefully fixed. I am not sure, but I fancy such a gauze screen could be woven in the fireproof asbestos. That, however, is a detail. I have given you the principle.

In the magic-lantern, such as is used by scientific men, there are possibilities not yet dreamt of by the scenic artist, for his use of the ordinary lantern has not been carried very far.

When my "Idyl" was on, a well-known actor said to me, after having examined the scene on my stage, "We can't get this quality on our London stage." I understood perfectly what he meant, because he used a term that belongs to painters in speaking of art. I will not attempt to define "quality"; suffice it that its presence is felt as much as its absence in a work of art. But quality in scenic work is not obtained without the greatest attention to the lighting—to the concentration of light in order to bring out essentials and leave out non-essentials.

Daylight is not garish; and in no light in nature is every object fully lighted up at any one moment. Yet so crudely are lights—electric lights especially—employed, that every device, every artifice, is cruelly shown up, and then good-bye to quality. Brilliance is not to be obtained by extravagant lighting, which can only result in garishness. Pictorial brilliancy is obtained by the very economy of light. Why are they so afraid of leaving some parts of the stage picture suggestive and indistinct, as we leave parts of our pictures? But for that, the actor's intentions must be made to harmonise quite as much with the intentions of the scenic artist as our painted figures are made to harmonise with the backgrounds of our pictures. It is always the painter, the painter, the painter, you see. You will have it dinnin' in your ears as you go away. But mark this, I do not consider the painter who merely designs the scenes by means of sketches to be worthy to rank with the great scenic artist, such a one as I have already described. Unless he actually carries out the work on the stage (with, of course, his assistants) he simply stands on the same level as the musical composer who does not score his own music for his orchestra.

Referring once more to my "Idyl," I felt the ground to be of such importance that I built up an uneven surface to imitate an old street, and I carved the cobbles. My purpose in doing this was a double one, to help me in the lines of the composition, which would have been very bad had the houses started out from the flat stage, and to prevent my young performers from attempting the so-called stage walk.

Such additional or upper surfaces for various stage grounds could easily be made and kept in stock. They would bring us another step nearer to artistic consistency. I shall never forget seeing Ophelia, in an open-air scene, lie down on the bare boards of the Opera House in Paris. Of course the poor Ophelia was mad, or she never could have done such a thing. By these upper surfaces, I do not mean soft rocks that are like bags and give way to the touch. In that great work "Parsifal," as performed at Bayreuth, they have in one scene trees starting out from the flat stage boards, and on one side a soft rock, just big enough to take one of those large ladies who take the part of Kundry. She throws herself upon this rock in a paroxysm of despair, and has her work cut out not to roll off on the other side.

Now, I fear it would be somewhat difficult, if not altogether impossible, to get the longed-for perfection or to get that particularly desirable quality into the scenic work when plays have to be changed frequently. For that purpose I have in my mind to experiment with a system of obtaining form and colour by means of powerful lanterns—in short, to reflect nearly the entire scene instead of painting it. Great care would have to be taken not to get the actors reflected as well. But I do not see this as an insuperable difficulty. Here I merely throw out the hint for some clever artist to take up and complete.

And now, in conclusion, a word about my moon. A round tin box, that was shut at the back and open in the front, was first made. I placed three electric lamps within, and closed the front with a lens. Over the lens I placed tissue-paper, upon which I painted the mountains of the moon. This box worked on two wires secured to the painted sky, behind the gauze. The upward movement of the moon-box was effected by means of a lever very slowly worked by a man. As the contrivance was some 4 ft. behind, and away from the gauze, neither the wires upon which it moved, nor the electric cord hanging from it, were visible through the gauze. But the light of the moon through this atmospheric medium was

truly bewitching. I reduced the electric lights to a mere glow for the rising of the moon, which produced the right colour, and then gradually increased the electric current as the moon rose in the slowly-darkening sky. Why the light passing through the gauze caused a halo round the moon I cannot tell. There it was, and that's enough science for me.

And now I have but to mention that this moon never rises out of Bushey.

The President said that, agreeably with Professor Herkomer's request, there would be no vote of thanks and no discussion that evening. This was certainly a subject upon which architects ought to have a good deal to say, and perhaps they might be aware that scenic art, as they now understood it, was originally invented by an architect in the early part of the sixteenth century. If there were any suggestions or criticisms on this most interesting and entertaining paper, he would suggest that they should be sent as soon as possible before the 15th of the month for the next issue of the Architectural Association Notes. There was one further subject in which they all took a great interest, viz., that of the Trinity Almshouses in the Mile End-road, and, as a resolution was passed at the last meeting, no doubt they would wish to hear something further upon the matter. He was afraid, however, that he could not give them any further information than what had already appeared in the Press. The matter was now entirely in the hands of the Charity Commission, but the evidence elicited at the inquiry lately held was exceedingly valuable, and very favourable to the retention of the Almshouses. They owed a deep debt of gratitude to Mr. Penrose and Mr. Macvicar Anderson for the loyal way in which those gentlemen had gone to work, having both spent two whole days down at the Mile End-road. All of them were exceedingly anxious for the retention of these most valuable examples of what Mr. Penrose considered Sir Christopher Wren's work, and would feel a debt of gratitude to those gentlemen. He could only hope that the evidence tendered by them would have the effect of preserving these Almshouses.

The President announced that at the meeting to be held on the 20th inst. an entirely new departure would take place, when they would have papers from artisans upon subjects connected with building, namely, by Mr. R. Rust on Wood-work, and by Mr. J. Toomey on Brickwork.

The proceedings then terminated.

MAGAZINES AND REVIEWS.*

THE *Gazette des Beaux-Arts* publishes an article on Hokusai, the Japanese artist, by M. Edouard de Goncourt. M. Maurice Maindron concludes his article on the Armoury at Madrid, dealing with the swords, of some of which illustrations are given. The article on Huet, the painter of animals and "Chinoiseries," is concluded. M. E. Bertaux contributes an article consisting of a review of M. Enlart's book, "Origines Françaises de l'Architecture Gothique en Italie." M. Bertaux thinks that the origin of Italian Gothic has been somewhat misunderstood in consequence of the earliest examples lying a good deal out of the beaten track; he gives an illustration of the church of Fossanova, consecrated in 1208, as a typical example; but we think the "French origin" in this will be hard to find except by those who intend to find it.

The *Revue des Deux Mondes* publishes a long article by M. de la Sizeranne on "La Religion de la Beauté," which is really an elaborate panegyric of Ruskin, who would be the last to accept the creed implied in the title. The French have just discovered Ruskin, and are doing all the proselytism over again a quarter of a century after date.

In the *Art Journal* Mr. Montbard continues his illustrated article on "The Sacred Island of Philæ." "The Lily in Art" is an interesting subject treated by Mr. L. B. Thompson, with illustrations by the writer; the illustrations include Japanese and Assyrian treatment of the flower as well as European. Mr. James Orrock contributes an article on Constable.

The *Architectural Record* has a very largely-illustrated article on the works of the late R. M. Hunt, giving views of a number of houses designed by him: this article and the illustrations form in

* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.

fact the principal contents of the number, and are a fine memorial to an eminent architect.

The *Studio* (November) contains an article by Mr. Baillie Scott on "The Fireplace of the Suburban House," from the illustrations to which we should think that the suburban fireplace was likely to smoke a good deal, but we have the authority of the late Mr. Richardson (the eminent American architect) for thinking that of no consequence so long as the fireplace looks well. The general style of work suggested has too much of the affectation of Medievalism about it. An article on "Incised and Embossed Leather-work" gives some good illustrations of what can be done in this class of decorative work.

The *Engineering Magazine* contains a very well-illustrated article by Mr. E. C. Gardner, on "School and School-house Architecture," to which we may return.

The *Nineteenth Century* contains an article (written in French) by M. Charles Viatore on "Delacroix et les Peintres de l'Ecole Anglaise," in relation to the recently published memoirs of Delacroix, who had visited England a good deal, knew the works of the leading English artists of his day, and had noted down various opinions on English art. M. Viatore of course treats the subject in an interesting manner. This is followed by a conversation - article by Mr. Frederic Harrison, between an admirer and a non-admirer of Ruskin, Mr. Harrison apparently identifying himself with the former: the subject is nowadays rather out of date.

Blackwood publishes an exceedingly interesting and lively article on "Oxford in Fact and Fiction," but in his almost unmitigated condemnation of the new buildings at Oxford the author shows less judgment and perception than in the social portion of his article. We agree with him, we must confess, as to "the huge barrack of red brick called Keble College"; but in general Oxford has been far more fortunate in its new buildings than most essentially antique cities where modern architecture has been unavoidably obtruded.

Le Monde Moderne, as usual, devotes a large amount of its space to artistic subjects, including an illustrated article on M. Fantin-Latour, the French painter who most nearly resembles Mr. Watts in his manner, though not in class of subject or in feeling; one on the Château of Versailles, with illustrations; other subjects being "Coins de Venise" (illustrated), "Le Couvent de Carmes," an old building likely soon to be demolished to make way for modern street improvements in Paris, and "Aérostation Militaire," which, in spite of the limiting adjective, may be generally interesting to scientific men who are concerned with aerial transit.

In the *Revue Générale* the Comte Conrad de Buisseret gives an architectural and social sketch of Washington; and we have had the seat of American Government described so often by American writers that there is some interest in seeing a French view of it. M. de Buisseret is struck by the quiet of Washington, "capitale silencieuse d'un Etat gigantesque tout fait de bruit, d'argent, et de commerce, comme un sanctuaire construit au milieu d'un quartier marchand"; and he regards the Capitol as, though wretched in its details, imposing from its general form and dimensions. The French inability even to copy English words correctly comes out more than once in the article, as where the President's abode is described "la célèbre Withe Lodge ou 'Maison Blanche'." (!)

In the *Gentleman's Magazine* Mr. Percy Fitzgerald's "Travels to the Source of the New River" may suggest to some London residents a walk which few of them probably have ever taken, and the exploration of a stream which is not without its historic interest.

While *Blackwood*, as above noted, writes of the Oxford of the present day, *Macmillan* gives us a sketch of "Oxford in the Thirteenth Century," dealing with ancient topography as well as ancient customs.

In the *National Review* Lieut. Baden-Powell describes a new aerial conveyance of his own, the "Air-car, or Man-lifting Kite." There are unfortunately no illustrations.

The *Fortnightly Review* contains an article by Mr. H. H. Statham, on "Mendelssohn—A Critical Estimate," which may interest some of our musical readers. It is to some extent a protest against the fashionable depreciation of the composer.

Harper has less than usual of artistic interest, but the article "From the Hebridean Isles," with illustrations, will interest those who have not visited the islands, or who think of doing so.

Scribner devotes a long article, with a number

of beautiful illustrations, to the life and works of Mr. Tadmara. The engraver treated of in the serial article on wood-engravers is Lepère, the illustrations being engraved by Lepère for his own drawings. These are fine and masculine works in which line is strongly emphasised; we confess however that we do not see the meaning or beauty of the lines drawn through the sky in the frontispiece engraving of Notre Dame, Paris. They seem suggested by an eccentricity of Rembrandt's.

In the *Century* an article, with numerous illustrations, is devoted to M. Tissot's illustrations of the "Life of Christ," which to many persons will afford the first idea of this rather remarkable effort to give a new pictorial reading to the subject. M. Tissot seems to have aimed at combining realism of fact with emotional expression. It may be questioned whether he has not overdone the realism in some scenes, but nevertheless it is a remarkable effort in illustrative painting, and should be better known than it is.

In the *English Illustrated Magazine* a short topographical article, "From Barnet and from Barnet Field," is illustrated with some sketches by Mr. Herbert Railton, which have not, however, cost their author much trouble. An article on the "Legion of Honour" may be of interest to some of our readers who hear a good deal about the bestowal of its insignia on architects, artists, and other men who have distinguished themselves; and it is just as well to understand foreign official grades of honour, though this particular one, we believe, is only bestowed on Frenchmen by birth.

The *Bulletin de Correspondance Hitténique*, including the nine months from January to October of the present year, is chiefly occupied with a record of the excavation work at Orchomenos.

The *Journal of the Royal Society of Antiquaries of Ireland* (quarterly) continues Mr. Coffey's paper on the origin of Prehistoric ornament in Ireland, and a considerable portion of the number is occupied by the record of the Galway meeting in July, with articles on the islands of Aran, and on Galway, which are of considerable interest.

The *Journal of the Sanitary Institute* (quarterly) includes Dr. Reid's important paper, and the discussion which followed it, on "River Pollution."

In the *Essex Review* the Essex Church illustrated and described is the very pretty and picturesque St. Thomas the Apostle, Navestock, with its timber-tower and spire and partially timber piers in the nave. It is a most interesting little church, and deserves more attention than it has received.

The *Quest* is as absurdly sham-Medieval as ever, and appears with the impossible figure on the cover, of which we gave a reduced copy on page 291; nor can we see any value in the literary contents. The purchaser will get some good bits of decorative borders and head-lines for his half-crown, and that seems about all.

Cassell's *Family Magazine* includes a historical article on "St. James's Palace," with illustrations; and another on "Pictures from Russian Studios," with a good many illustrations from works not much known in this country.

"The Foundling Hospital" and "Trinity House" form, in the *Windsor Magazine*, the subjects of two of the illustrated descriptions of buildings of historic interest, which are perhaps among the best of the novel features in periodical literature.

We have received the Christmas number of the *Queen*, which shows a liberal supply of literary matter—some of it good—and some clever engraved illustrations, especially those to a story of Bret Hart's. We always wish that ladies' papers would set a better example in their fashion-plates, and not draw females with such exaggerated and impossibly small waists, which would be hideous even if they were possible.

No. 27 of "Pictures from Punch" is an unusually good number, and contains many admirable old "Leeches" and "C. K.'s."

The Christmas number of *St. Nicholas*, the "young folks' journal," is a very good one, and includes among its illustrations some really clever and charming things.

ROYAL ACADEMY SCHOOLS:

LIST OF PRIZE-WINNERS.

The annual distribution of prizes to the students of the Royal Academy of Arts took place at Burlington House on Tuesday, Sir F. Leighton, P.R.A., presiding.

Sir F. Leighton, in opening the proceedings, said that on previous occasions he had delivered

to them a Presidential Address, which had caused them for some time to feel a natural anxiety as to the results of their competitions. Last spring, however, among many acts of kindness which he had received at the hands of his brother members, in view of his health, they had requested him to abstain from the arduous labours of preparing and delivering an address, and he would therefore simply ask the Secretary to read the fateful list.

The Secretary then read the following list:—

Historical Painting, Gold Medal and Travelling Studentship (200*l.*), Harry Robert Mileham; Landscape Painting, Turner Gold Medal and Scholarship (50*l.*), Cecil Ross Burnett; Landscape Painting, Creswick Prize (30*l.*) Edward Harry Read; Painting of a Figure from the Life (open to Male Students only), Silver Medal, 1st, Victor John Robertson; 2nd, Owen Baxter Morgan; Painting of a Head from the Life, Silver Medal, 1st, Cecil Ross Burnett; 2nd, Arthur Huiush Webber; Painting of a Draped Figure (open to Female Students only), Silver Medal, 1st, not awarded; 2nd, Rose Livesay; Cartoon of a Draped Figure, Silver Medal and Prize (25*l.*), not awarded; Design in Monochrome for a Figure Picture, Armitage Prizes, 1st (30*l.*) and Bronze Medal, Alexander George Small; 2nd (10*l.*), Niel Kenneth McKeechie; Design for the Decoration of a Portion of a Public Building (Autumn), Prize (40*l.*), Harold Edward Speed; Set of Six Drawings of a Figure from the Life (open to Male Students only), 1st Prize (50*l.*) and Silver Medal, Bernard C. H. Schumacher; 2nd, (25*l.*), Shirley Chas. L. Slocombe; 3rd, (15*l.*), Owen Baxter Morgan; 4th (10*l.*), John Shenton Eland; Drawing of a Head from the Life, Silver Medal, 1st, Rose Evelyn Clark; 2nd, Mary Isabel Phelps; Drawing of a Statue or Group, Silver Medal, 1st, not awarded; 2nd, not awarded; Perspective Drawing in Outline (open to Painters and Sculptors only) (The Small Cloisters, Westminster Abbey), Silver Medal, no competition; Composition in Sculpture (Dædalus and Icarus), Gold Medal and Travelling Studentship (200*l.*), Francis Derwent Wood; Model of a Design (Captives), 1st Prize (30*l.*), Charles Beacon; 2nd (10*l.*), Alfred Bertie Pegram; Set of Three Models of a Figure from the Life (open to Male Students only), 1st Prize (50*l.*) and Silver Medal, Francis Derwent Wood; 2nd (20*l.*), Charles Beacon; Design for a Medal: Silver Medal, Francis Derwent Wood; Model of a Bust from the Life (open to Female Students only), Silver Medal, 1st, not awarded; 2nd, Mary Towgood; Model of a Statue or Group, Silver Medal, 1st, not awarded; 2nd, no competition; Design in Architecture (A Town Church, the Plan to be in the form of a Greek Cross), Gold Medal and Travelling Studentship (200*l.*), Pieter Rodeck; Set of Architectural Drawings (The Horse Guards), Silver Medal, 1st, Archibald Haswell Christie; 2nd, William Hawke; Set of Architectural Designs (Upper School), Prize (25*l.*), George Weald; Set of Drawings of an Architectural Design (Lower School), Prize (10*l.*), Pieter Rodeck; Plan of a Building (A Club House), Prize (10*l.*), William H. Edw. Brown; Original Composition in Ornament, Silver Medal, no competition; Perspective Drawing in Outline (open to Architects only) (An Interior View of St. Stephen's, Walbrook), Silver Medal, no competition. The Landseer Scholarships in Painting and Sculpture, of 40*l.* a year each, tenable for two years, have been awarded—in Painting to Charles Henry Sims and Francis Owen Salisbury; in Sculpture to Clement William Jewett.

THE SANITARY INSPECTORS' ASSOCIATION.

The last monthly meeting for the year of this Association was held on Saturday last, at Carpenters' Hall, London Wall, Mr. H. Thomas (Chairman of Council) presiding. A paper was read by Mr. Jones (Inspector, Lambeth Board), on "The Public Health Acts, with Suggestions for their Amendment." From the many Acts of Parliament which placed such multifarious duties upon the sanitary inspectors, from the detection of unwholesomeness and disease in meat or of adulterations in food and drugs, to the inspection of drains and of dwellings, varying in importance from the mansion to the canal-boat, the lecturer selected three Acts for consideration in the paper. The first was the Metropolis Local Management Act (1855), which gave such full powers to Local Authorities in regard to the drains on new property,

* Disqualified owing to having received the same prize before.

that it became a matter for astonishment that so large a proportion of the existing drains were radically defective; the second was the Public Health Act of 1875, which formed a sanitary code for all England outside the metropolis, and the third the Public Health (London) Act of 1891, which provided a similar code for the metropolis. The last-named Act obviously intended to give the fullest powers of dealing summarily with nuisances and for their prompt abatement when discovered, but from one cause or another, or rather from a great diversity of causes, the intentions of the Act had been very inadequately realised in practice. Two weeks is the shortest time in which the most energetic and best-supported inspector can enforce the abatement of a nuisance, which the Act intended to be summarily dealt with, but long delays arise, as the inspector must first report to the Sanitary Authority (a committee that meets once a fortnight, once a month, or in summer, perhaps, once in two months), before he can serve his statutory notice. If this were disregarded, another notice must be served involving further delays, before a magistrate's summons could be applied for. Should the summons be granted, the magistrate might extend the period of grace by three, six, or even nine more weeks, so that a negligent or obstinate person might take more than three months before he set about this so-called "summary abatement," while a person who was at the same time "rich and obstinate" might, by litigation, extend the period of grace almost indefinitely. The same red tape, circumlocution, and waste of time, he said, characterised the procedure in many other important matters which the sanitary inspector had to deal with. He was required to be a competent and qualified person, but before he could bring his knowledge and his competence to bear upon the situation, he must obtain permission to act from a board consisting of butchers, bakers, bootmakers, blacksmiths, bricklayers, and tradesmen of other kinds, who have no special competence. The climax of absurdity was reached when the law allowed "any person" (other than the sanitary inspector) to go straight away to a justice to make a complaint which he might there and then deal with if he chose. It was surely an anomaly that anyone not a qualified inspector could be invested with greater facilities for carrying out a Health Act than Health Officers themselves. The Act of 1875 left provincial sanitary inspectors in a similar anomalous position, but in some districts where progressive ideas had prevailed, the local acts were in advance of the London Acts. With regard to the 1855 Act, the lecturer attributed the fact, that London, after forty years, had still defective drains innumerable, and houses with basements subject to periodical floodings by sewage, to the dual control given to surveyors and sanitary inspectors, who, in most districts, divided the supervision between them. The combined drainage difficulty was, he said, another result from the same cause. Islington, St. Martin's-in-the-Fields, and West Ham were cited as districts in which thousands of pounds per annum had to be spent now on repairs that should have been made good by the owners. The London County Council were promoting a Bill to relieve local authorities from the serious position they find themselves in, owing to their surveyors having failed to advise them in every instance to make an order. Among the suggestions made for the improvement of the Health Acts and their administration were, the appointment of a Minister of Public Health, security of Tenure of Office, with salaries adequate to attract men of good education and experience, and certain improvements in procedure. It would often be a great advantage to the owner or occupier to have a statement put on the first notice showing what he was required to do. He could then easily get tenders for the work or estimates of cost which would relieve him from the dread of unknown costs which he generally now feels when he received a notice.—

The usual discussion followed on the proposal of a vote of thanks, in which Messrs. Addison (Streatham), Lightfoot (Chelsea), Bush (Epping), Legg (Hackney), Young (Battersea), Grigg (Fulham), Jacklin (Waldstone), Kelf (Bethnal Green), Alexander (Shoreditch), and the Chairman took part. Mr. Legg stated that in a case he had had to deal with in Hackney, he had served a notice upon the owner of the property where the nuisance was, and when the case was heard in court it was adjourned for twenty-eight days. At the expiration of that time when the case was brought to the court it was adjourned for another twenty-eight days. The nuisance had therefore been going on for fifty-six days before any steps were taken in the matter. Mr. Thomas,



before putting the motion to the vote, wound up the discussion with the observation that the sanitary inspector was working for the public good, but that the public did not seem to be yet fully aware of the fact. The vote was accorded with acclamation.

Illustrations.

SILVER ALTAR-CROSS, SALISBURY CATHEDRAL.

THE total height of the cross, including the new stem and base, is 4 ft. 2 in. The cross itself, which dates from the sixteenth century, was purchased by Mr. E. Doran-Webb, on behalf of the Chafyn Grove Memorial Committee, from Mr. Lambert, of Coventry-street. It is of beaten silver, mounted on a wooden core, and measures 25 in. by 24 in.; it was formerly used as a processional cross, and still retains the catches for the little silver bells which hung from the head and the ends of the arms. On each side

of the cross are five raised plaques of silver-gilt. On the front side the subjects represented on the plaques are as follows:—In the centre is the Blessed Virgin supporting the infant Christ, her feet resting on a crescent; on the right and left are the Mater dolorosa and St. Joseph; above these is the "pelican in her piety," the emblem of the church, and beneath is our Lord rising from the tomb. On the reverse side of the cross the central plaque bears the sacred monogram I.N.R.I., and on the plaques to the right and left of it, the one bears the figure of St. Luke with his emblem the bull, the other St. Mark with the lion, St. John with his emblem the eagle is represented in the plaque above the monogram, and below is St. Matthew with a ministering angel. The new work, carried out from the designs of Mr. E. Doran-Webb, F.S.A., by Messrs. Barkentin & Krall, of Regent-st., commences with a canopied knop 6 in. high by 4 in. wide, containing four niches, each of which is occupied by the statuette of a saint. The four saints represented are St.

Aldhelm, holding a model of his church; St. Osmund with the Sarum Use in his hand; St. Edmund (Archbishop) making a vow before a figure of the Virgin; and St. Thomas of Canterbury, wearing the pallium, and bearing his Archiepiscopal cross. The foot of the knop is set on a twisted stem, which, in turn, is carried down to an octagon, the latter rising from a chalice-shaped foot, supported by four claws. Round the lower rim of the base is the following inscription written by the Bishop of Salisbury:—

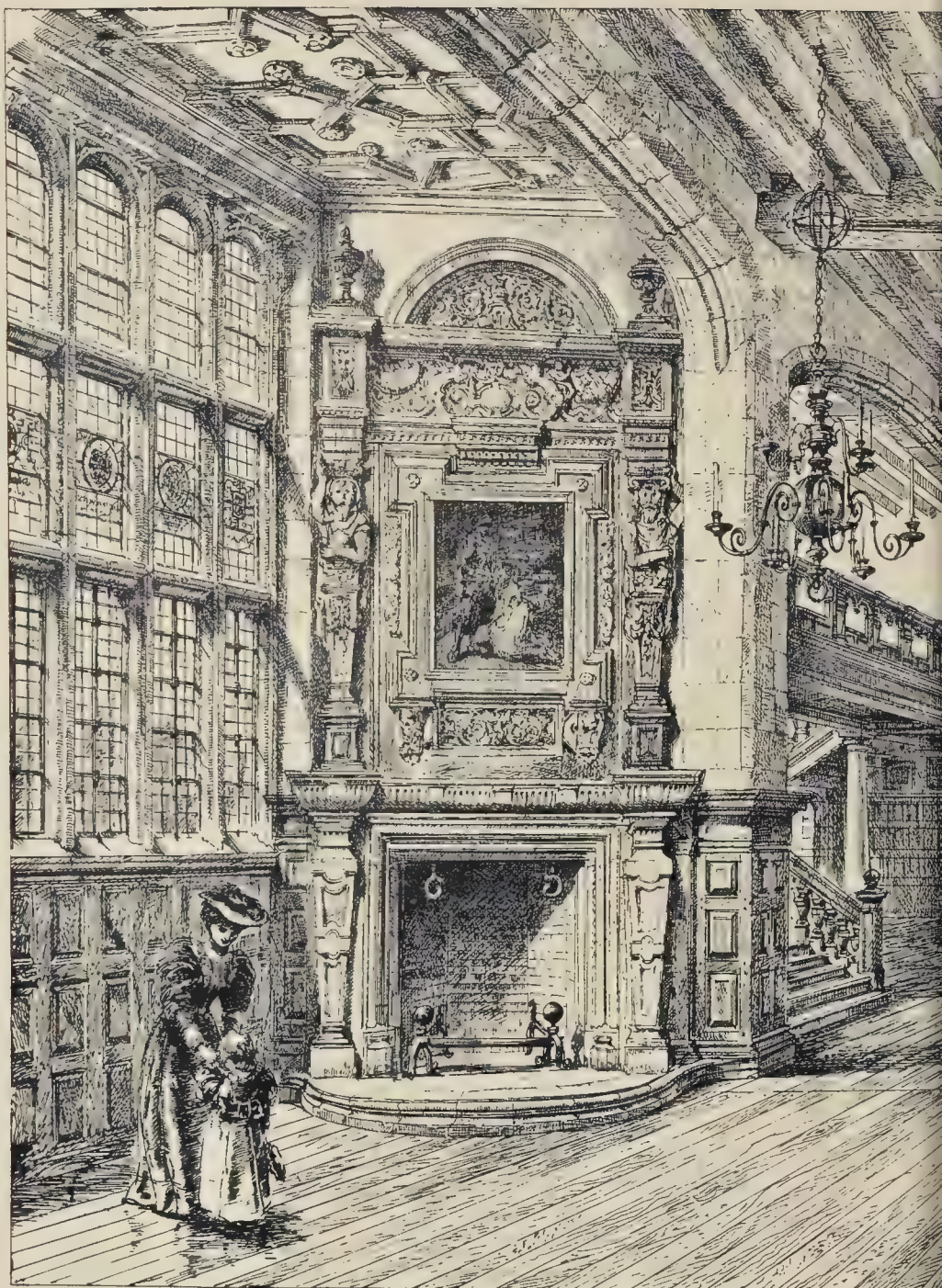
IN HONOREM CRUCIFIXI ET IN USUM ECC'LE
B.M.V. SARISB' HANC CRUCEM OPERIS HIS-
PANICI IN MEMORIAM JULIE ELIZABETHE
CHAFFYN GROVE QUÆ OB: XXVII. DIE NOV.
A. S. 1891.

D. D. P. AMICI ET CONSANGUINEI.
"AETERNÆ FAC CUM SANCTIS GLORIA MUNERARI."

THE HALL, ASHORNE HILL HOUSE.

THIS house is built on rising ground about four miles from Leamington. The materials used

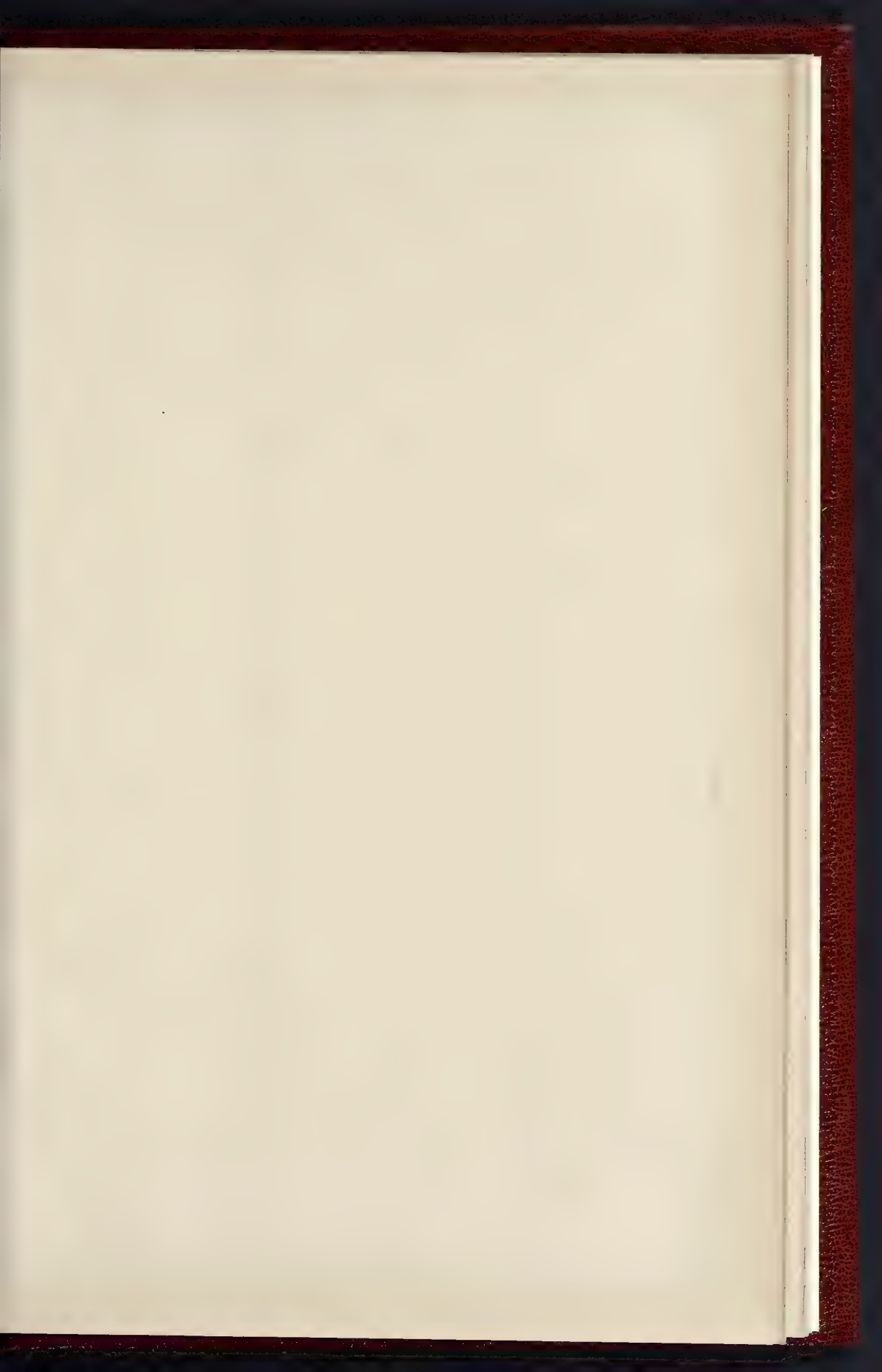


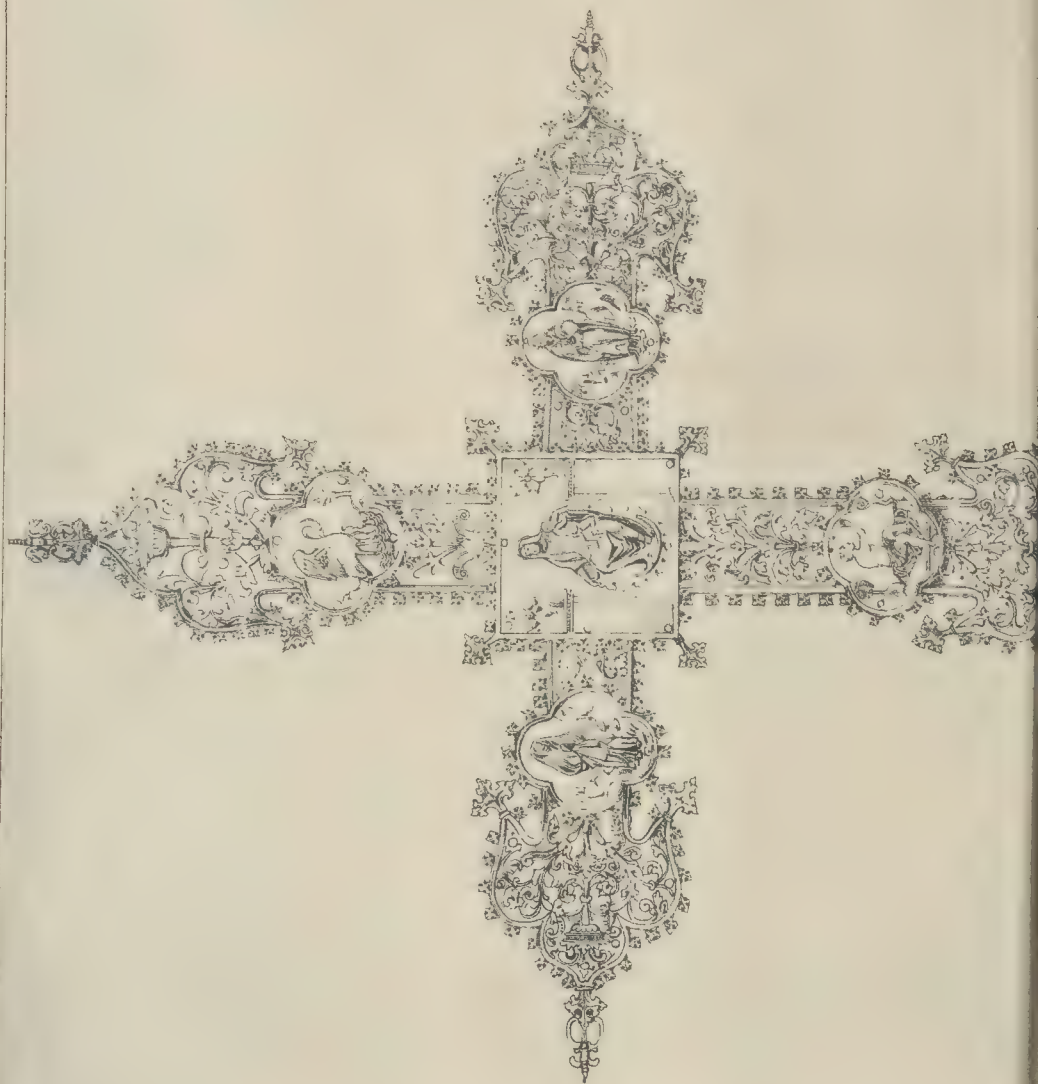


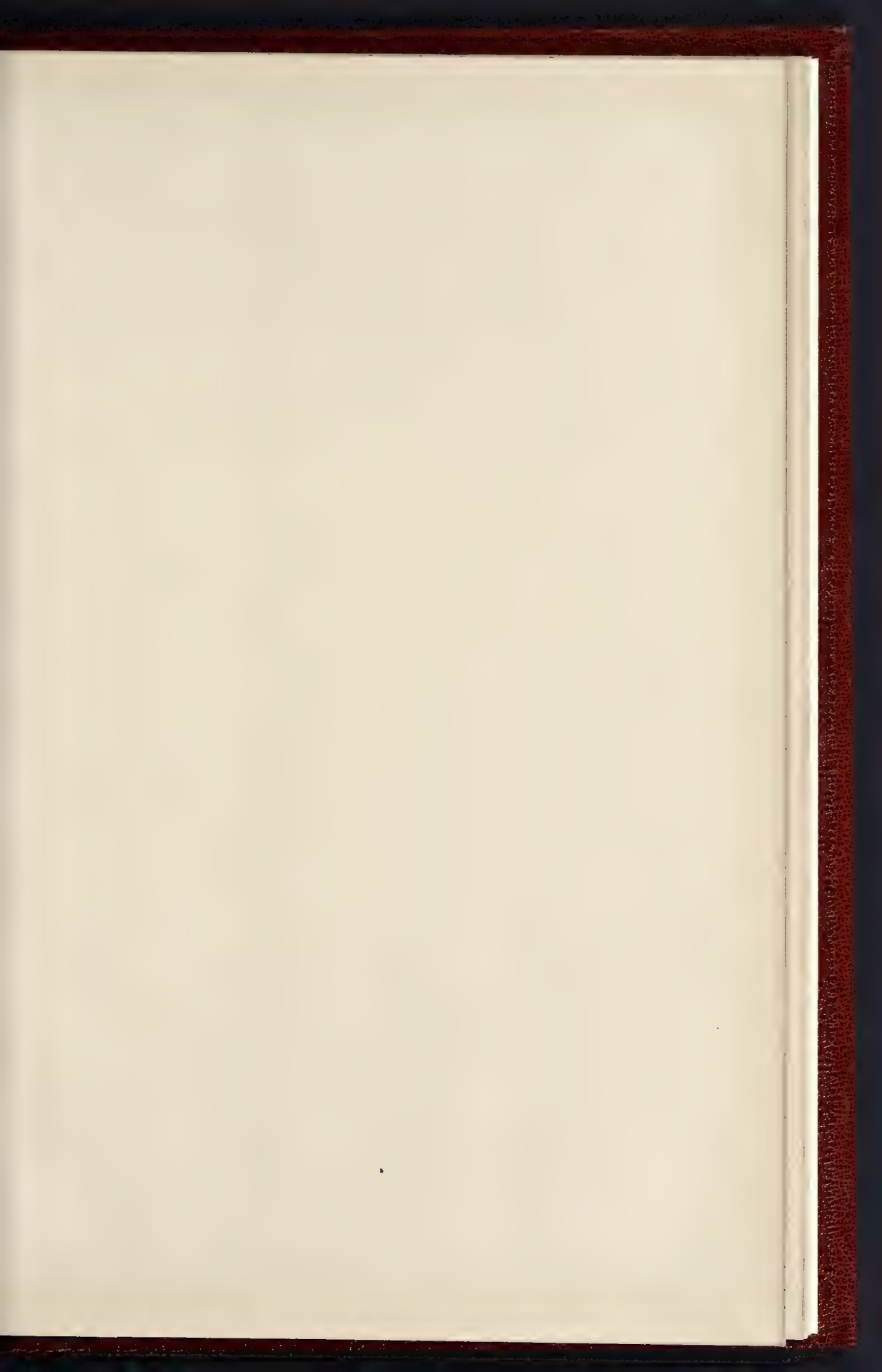
ASHORNE HILL HOUSE: INTERIOR



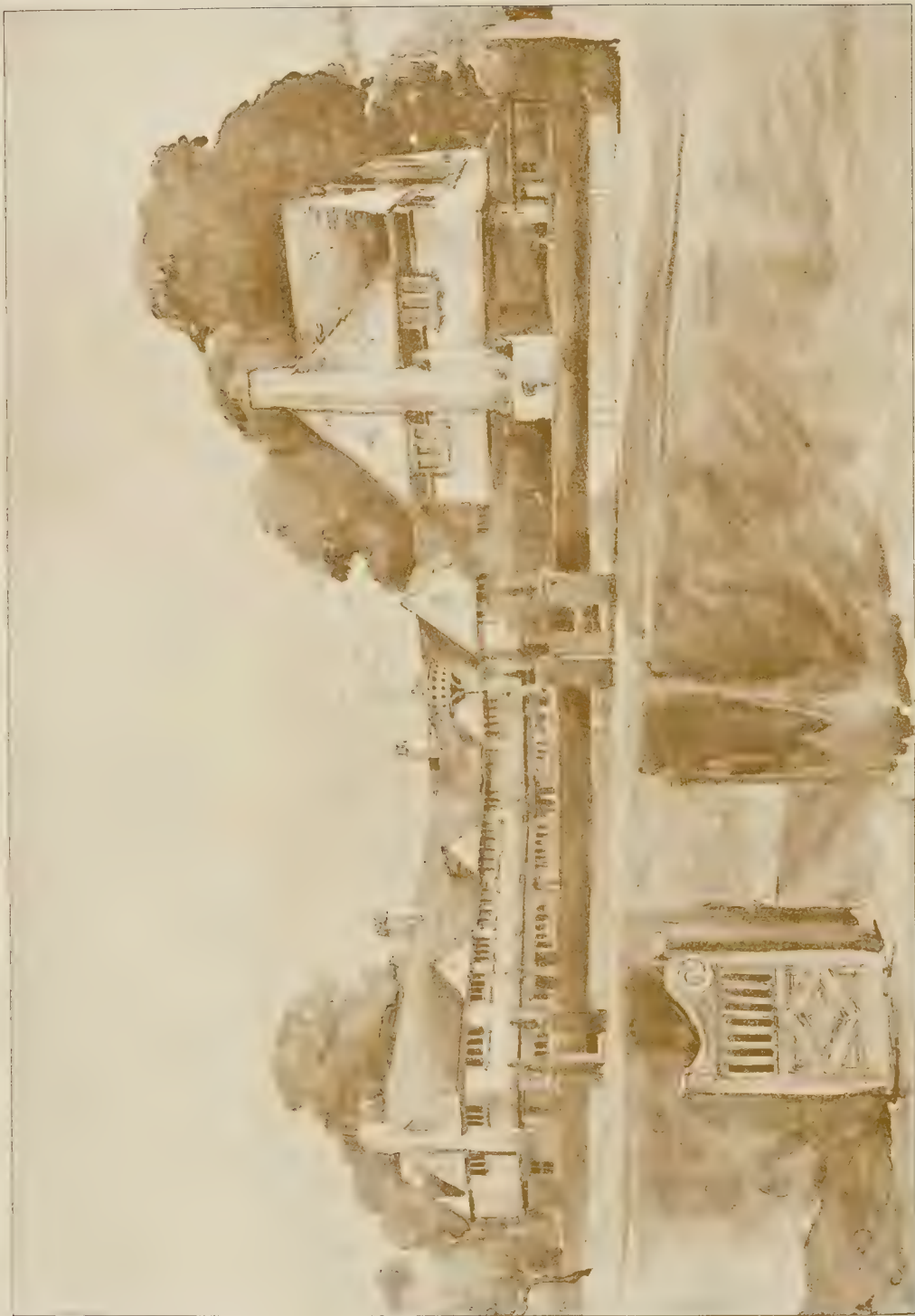
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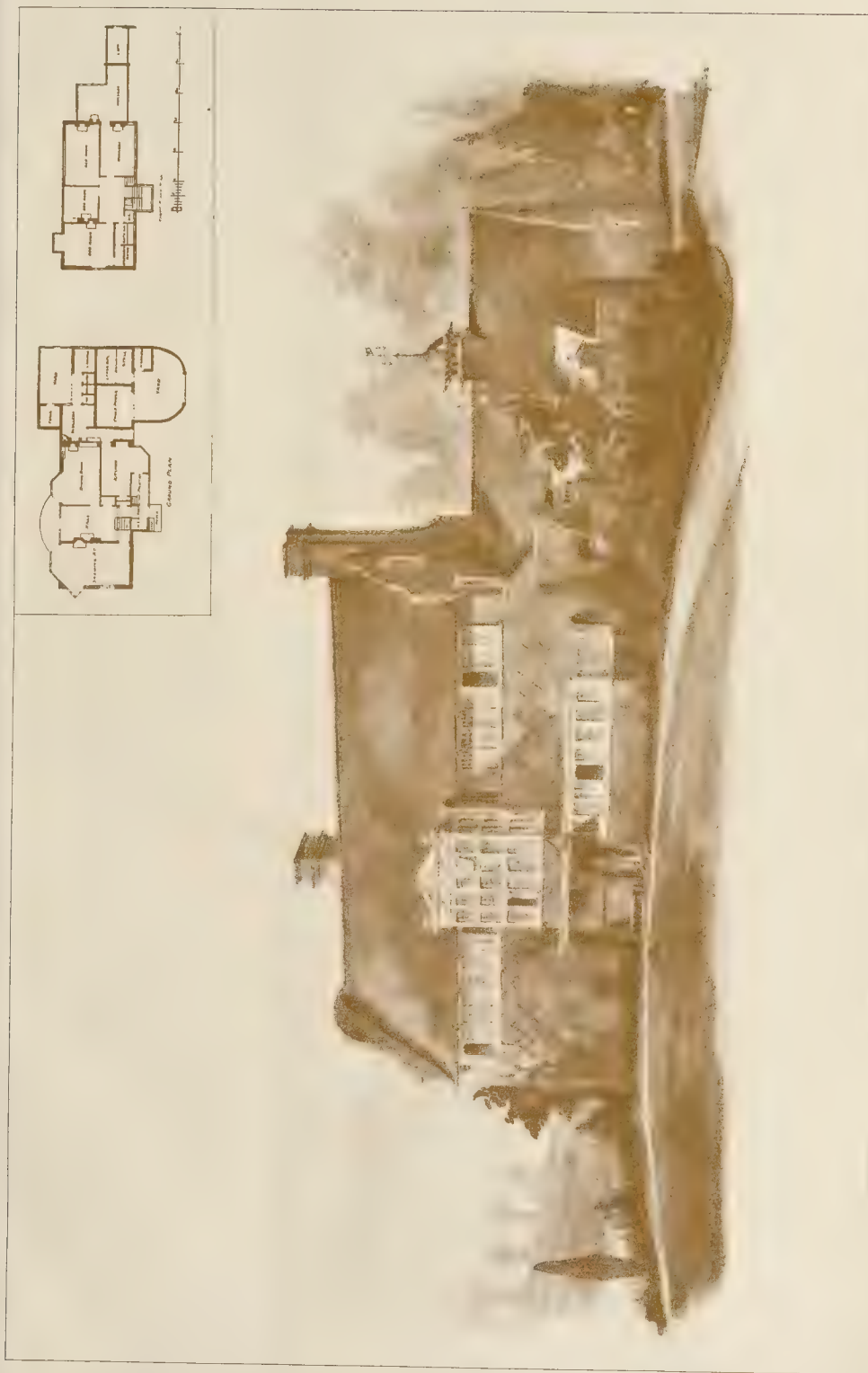






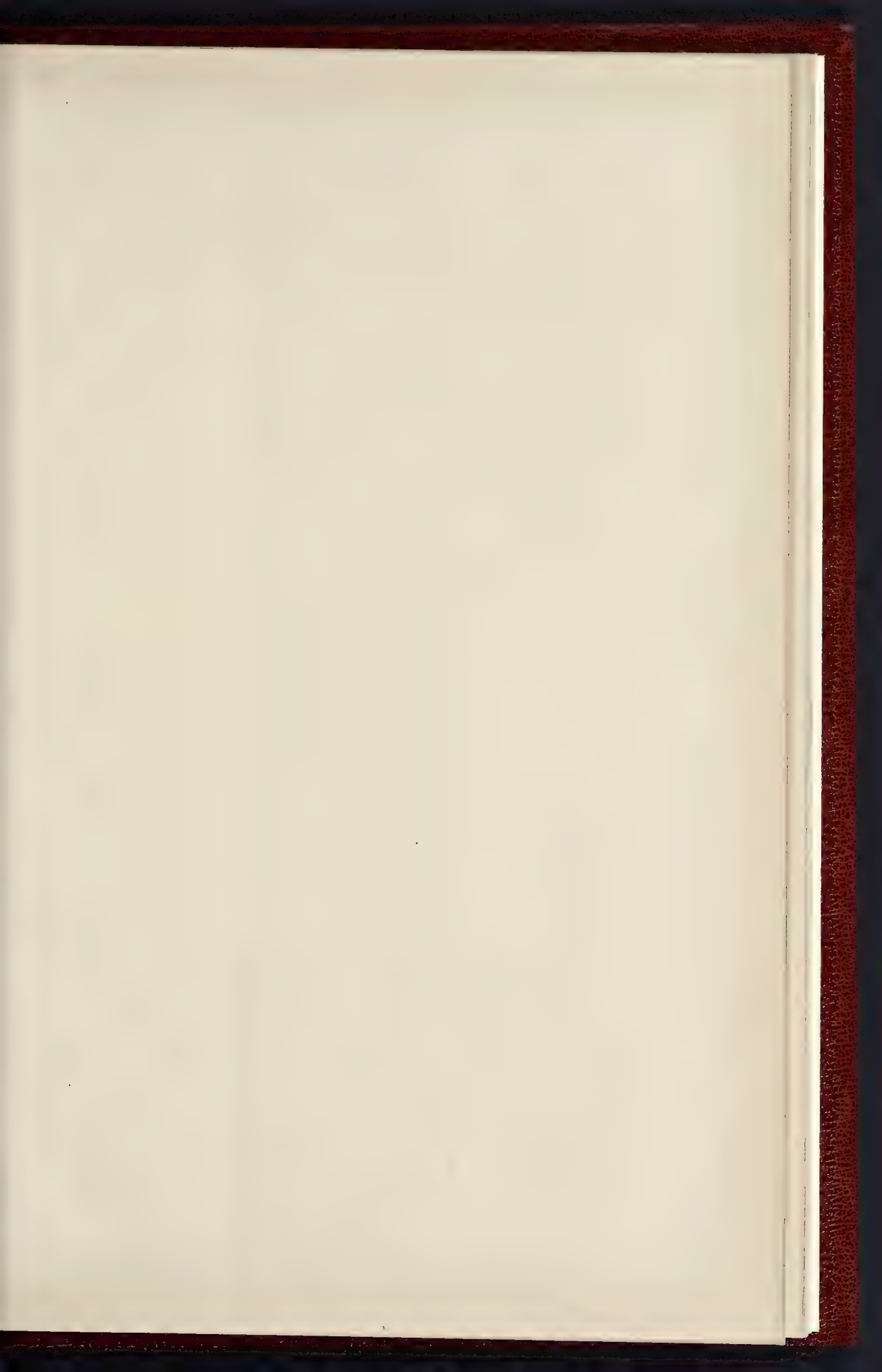
THE BUILDER, DECEMBER 14, 1895





A HOUSE NEAR LEICESTER. MR. JAMES KINGSFORD, ARCHITECT.

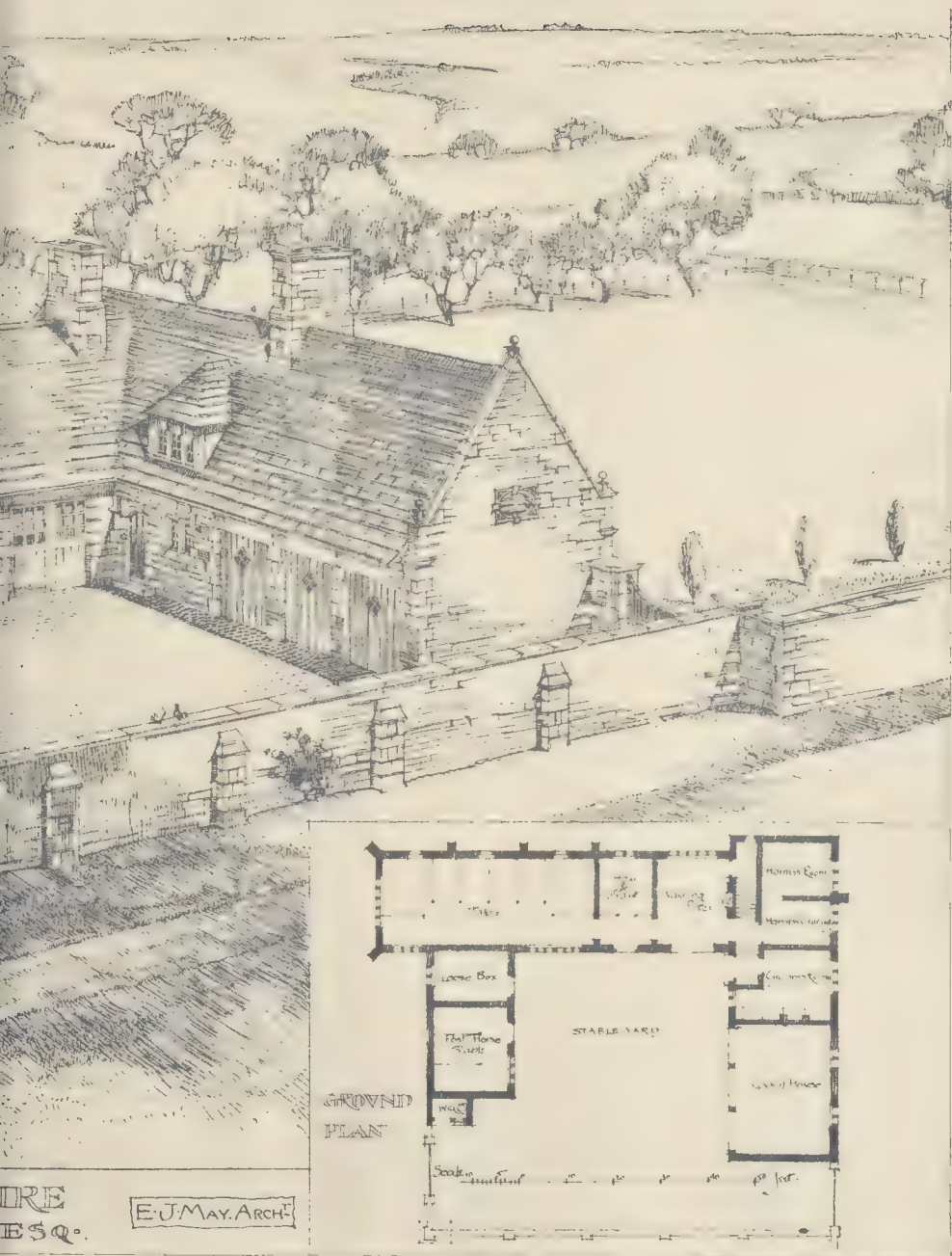
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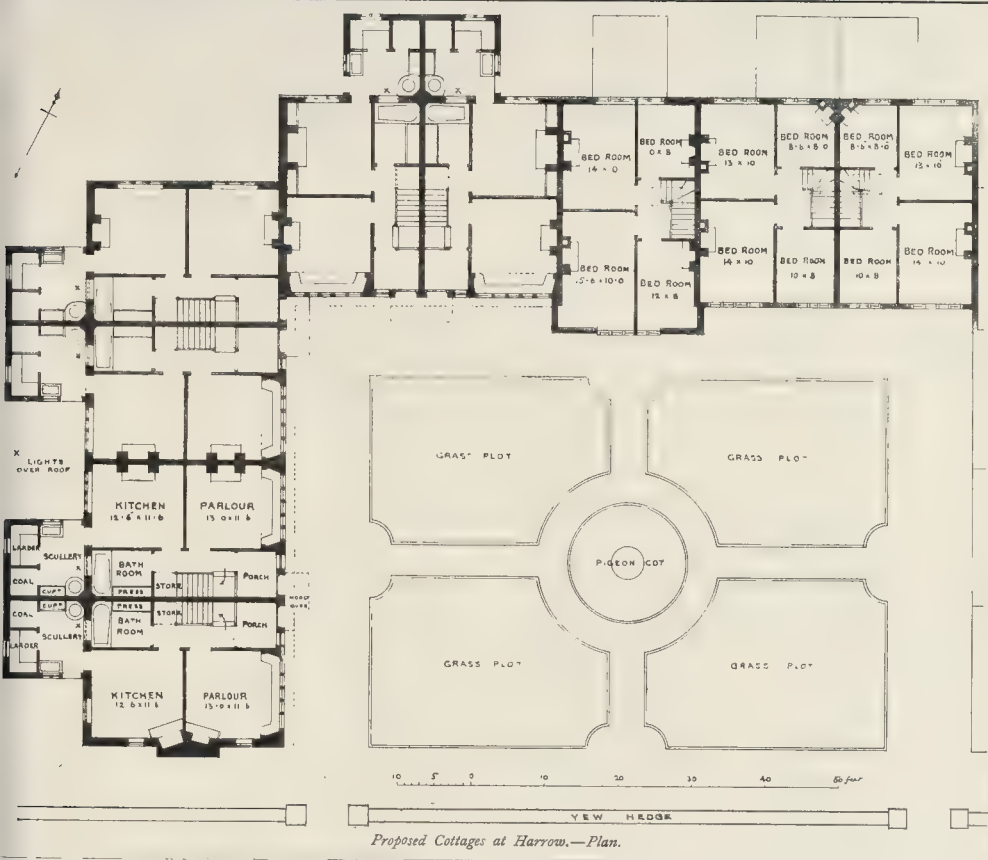




[Drawing by]

STABLES AT SHAW HILL, WILT
for CHAS. AWDEN





are Honiton stone for the walling and Milton stone for the dressings, with red tiles for the roofs. The reception-rooms are to be panelled with oak, of which the staircases, galleries and floors are also made. Messrs. Parnell & Son, of Rugby, are the contractors, and Mr. Chappell is the clerk of works. The architect is Mr. E. Goldie, of London.

The illustrations comprise the complete plan of the house, and the perspective view of the interior of the hall. The drawing from which this is taken was exhibited at the last Royal Academy exhibition.

STABLES, SHAW HILL, WILTS.

THESE stables have lately been completed. They are built in Weal-stone, and the roofs covered with stone tiles partly collected from old buildings and partly new, the latter being difficult to get new in this neighbourhood. The builder was Mr. H. Hoskings, of Hungerford, and the architect Mr. E. J. May, of London.

PROPOSED COTTAGES AT HARROW.

THESE cottages were designed to form part of a large philanthropic scheme to provide homes for young married men of the working class.

The intention of the author was to group the cottages not only in blocks of two and three together, but also to form several quadrangles with buildings round three of the sides.

One of the quadrangles is here shown. Each cottage contains a parlour, kitchen, &c., and four bedrooms. The materials to be of red brick, with tiled roofs, plaster being freely used on the exterior of the upper floors and gables.

The perspective view, which appeared in this year's Academy Exhibition, was kindly executed for me by Mr. H. Wilson.

T. PHILLIPS FIGGIS.

HOUSE NEAR LEICESTER.

THIS house was built about twelve months since at Knighton, a suburb of Leicester, from the

designs of Mr. James Ransome, architect, of London. Messrs. J. E. Johnson & Son of Leicester were the builders; the plumbing and sanitary work was executed by Mr. Arthur Biggs, and the ranges and hot-water fittings by Messrs. Pochin & Son: all of Leicester.

The hall staircase and landing are panelled in dark wood. The reception-rooms face south and communicate with each other by a verandah. The exterior materials are brick, with red tiles for the roof.

LANCASHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.

THE half-yearly meeting of this Federation was held at the Devonshire Hotel, Blackburn, on the 3rd inst. The President, Mr. John Fecitt (Blackburn), was in the chair, and there were present representatives from Accrington, Blackburn, Bolton, Burnley, Chorley, Colne, Nelson, Oldham, Preston, and Rochdale. The minutes of the first general meeting, held at Accrington, in June last, were read and confirmed, and the Report of the Executive Committee unanimously adopted. In their report the Committee referred to the progress made during the half-year, which they regarded as satisfactory. Two local associations, Oldham and Burnley, had joined during that period, and meetings had been held in the Bury and Heywood district, and in Ashton-under-Lyne, Stalybridge, &c., which were expected to result in an early accession of strength. Their secretary (Mr. J. Tomlinson, Preston), was in communication with the principal towns in the county not at present affiliated, and no efforts would be spared to form a strong association. The relations between employers and operatives in the federated towns during the last six months were also reviewed, and the committee were able to congratulate members on the benefits employers had already derived from the Federation.

A recommendation to amend the Rules was referred back to the committee for further con-

sideration, on the motion of Mr. W. Cunliffe, Bolton.

On the motion of Mr. R. Highton, Blackburn, it was resolved to adopt the Conditions of Contract issued by the National Association of Builders, for use in those towns not having an approved form at present, and in view of recent judicial decisions with respect to the liability of employers as regards bound apprentices, the secretary was instructed to submit a form of indenture for counsel's opinion and bring the same before a future meeting for adoption. A uniform system of quantity surveying and treatment of prime cost sums in quantities was thought to be desirable, and the committee were directed to take the matter into consideration and report to the next meeting what steps it was desirable to take.

Notices for changes in wages or alterations in working-rules pending at Accrington, Blackburn, Bolton, Nelson, and Preston were considered; reports were received from representatives respecting the action proposed to be taken as to craneage charges by railway companies; and other matters of trade interest were discussed. A vote of thanks to the Chairman, proposed by Mr. S. Smethurst, Oldham, and seconded by Mr. Whittaker, Accrington, was acknowledged, and the meeting terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

The Superintending Architect.—The report of the General Purposes Committee contained the following paragraph, the recommendation being agreed to without discussion:—

"We have had before us a letter, dated November 13, 1895, from Mr. T. Blashill, the Superintending Architect, intimating that he will attain, early this month, the age of sixty-five years. Mr. Blashill was appointed by the late Metropolitan

Board of Works in February, 1887, and he has thus served nearly nine years. He pointed out that when the office of Superintending Architect was last vacant the Board found it necessary to advertise twice, and that on the second occasion the maximum age limit of fifty years previously prescribed was withdrawn, thus throwing the appointment open to gentlemen like himself who were over fifty years of age. The standing order as to the retirement of officials at sixty-five was not made until some years after his appointment. Mr. Blashill's case is a peculiar one, but apart from that we hold the opinion, in which we believe the Council will concur, that Mr. Blashill's services are of such value that his retirement at the present time would be a serious inconvenience to the work of the Council. We think, however, that the time has arrived when the organisation of the Architect's Department should be reconsidered, and we suggest that a reference should be made to us for the purpose. We recommend—

"That, as the retirement of Mr. T. Blashill would cause inconvenience to the public service, he do continue to hold his appointment for another year, and that it be referred to the General Purposes Committee to report whether (if any) changes in the work of the Architect's Department it is now desirable under the circumstances to make."

Proposed Main-drainage Extension.—The Main Drainage Committee brought up a long report on the question of the main-drainage of London on the north side of the Thames. The report commenced with a brief outline of the general features of the main-drainage system of London and then proceeded as follows:—

"In the early days of the Council there was considerable difference of opinion on the subject of the main-drainage, and it was questioned whether the mode of chemical precipitation was the proper mode of dealing with the sewage, and whether it would not be a wiser course to discharge the whole of the drainage of London at some point on the coast of Essex. This among other things, raised the whole question of the pollution of the river and the subject of flood prevention. At that time the complaints of flooding in wet weather, especially in the Isle of Dogs, were so frequent as to seriously engage the attention of the Council. This agitation resulted in the Council determining on December 17, 1889, to secure the services of an eminent civil engineer to join the Chief Engineer of the Council in a full examination of the whole system. In accordance with this resolution, Sir Benjamin Baker and Mr. Binnie made a thorough and careful inquiry, and their joint report, dated 18th February, 1891, was in due course laid before the Council. This report deals with (1) the present condition of the main drainage system on both sides of the river; (2) the chemical treatment of sewage, then just inaugurated at Barking; (3) the condition of the river Thames; (4) the new works necessary in order to bring the existing main drainage system up to present requirements, and to provide for future increase; and (5) the question of new outfalls, either at Maplin Sands or in Sea Reach. The engineers pointed out that the discharge of sewage into the sea on the Maplin Sands would probably entail an expenditure of eight millions in capital and an annual charge of 80,000*l.*, and that to take the effluent flowing from the north side of the Thames to Shell Haven at the top of Sea Reach would very likely cost about 1,600,000*l.*, with a probable addition of 40,000*l.* if a portion of the sewage from the south side were carried forward to Sea Reach, together with an annual expenditure of 50,000*l.* for maintenance. They strongly advised that the mode of treatment by chemical precipitation at Barking and Crossness should be carried to completion before any further expenditure was incurred in removing the outfalls to more distant sites; and they expressed the opinion, which has been more than confirmed by subsequent experience, that the discharge of properly clarified effluent into the Thames at Barking and Crossness would be attended with the most beneficial results. As regards the works necessary to make the present main drainage system more effective, and to prevent more entirely the pollution of the river, they reported that the works as originally designed had become overtaken on account of the increase of population, and that the storm outlets into the Thames were brought into operation whenever the rainfall amounted to one-tenth of an inch. It was also pointed out by them that the two main outfall sewers from Old Ford to Abbey-mills were incapable of receiving the full quantity brought to them by the high and middle level sewers, and that the discharging power of these two outfall sewers, with that of the low-level sewer, exceeded the capacity of the three large outfall sewers into which they poured their sewage, extending from Abbey-mills to Barking. To remedy these defects, they proposed that, in addition to the existing outfall sewers from Old Ford to Barking, two new outfall sewers should be constructed parallel with them, and that to prevent the sewage from the higher parts of northern London flowing into and surcharging the already overtaxed middle and low-level sewers, a new intercepting sewer should be constructed, extending from Paddington to old Ford. Dealing with the Isle of Dogs, they suggested the cutting off of this area from all connexion with the low-level sewer and the con-

struction of an independent sewer to carry the sewage from the Isle of Dogs to the Abbey Mills pumping-station, for which independent pumping power should be provided. The works proposed by them on the north side of the river were roughly estimated to cost 920,000*l.*, made up as follows:—New outfall sewer, Old Ford to Barking, 620,000*l.*; new intercepting sewer, Paddington to Old Ford, 25,000*l.*; separation of Isle of Dogs and Hackney Wick branches, including pumping engines, 55,000*l.* On March 10, 1891, we reported that in our opinion the proposals for improving the existing system of main drainage were of so urgent a character that no delay should take place in acting upon them, and we recommended that detailed plans of the new sewers should be prepared. This recommendation was adopted by the Council on April 14 following, with a proviso that a further report should be obtained having reference to (a) the separation of the rainfall from the sewage in districts where it might be practicable; (b) the more complete prevention of overflow of storm-water into the Thames and Lea; and (c) the better purification of the river. With regard to (a), it may be stated that it was dealt with in the report of Sir B. Baker and Mr. Binnie, and that such a proposal, involving as it would do a double set of drains and sewers in every street, would, if carried out, cost about twenty millions sterling. As regards (b) and (c) we have since this matter was before the Council applied ourselves to the endeavour to fulfil the desire of the Council. The Council has already upon our recommendation carried out with great success the recommendation in the joint report which dealt with the sewage of the Isle of Dogs, and from time to time various other works have been constructed. In addition to these works are the construction of a new sewer in The Grove, Hammersmith; a new storm-relief sewer in Hackney from Mare-street to Mornington-lane; the improvement of the Limekiln-dock sewer; the reconstruction of the Ironstone sewer; the extension of the relief sewer from Hackney to Holloway; and the extension of the Fleet storm-relief sewer to Hampstead. At the present time the Council is constructing a sewer between Hammersmith and Walham Green, about 6,700 ft. in length. These sewers for the most part take a northerly and southerly direction and are in addition or supplementary to storm-relief lines and storm overflows constructed by the late Board; consequently, they have the effect of increasing the flow of sewage into the Thames during rain. The engineers, in their report of 1891, point out that it is not so much the discharge of sewage in times of heavy rain which pollutes the river, the sewage at such times being so diluted that little harm can accrue; danger is to be apprehended more from the continued discharge on days of slight rainfall. The Chief Engineer has always said, when the question of constructing relief sewers has been under consideration, that he could only recommend them on the condition that the main intercepting sewer recommended in the joint report should also be constructed, as relief sewers without the additional intercepting sewer would merely accentuate the defects complained of. They would in course of time involve a partial return to the system of direct discharge into the river, for the prevention of which the late Board of Works was constituted and the main drainage system established. In reports dated 15th February, 1894, and 17th October, 1895, the Chief Engineer has again called our attention to the necessity of at once undertaking the works required on the north side of the Thames, and gives, as a basis of comparison, the following: that the population of London has increased about a million above the 3,413,400 persons for which the main drainage system was designed, the figures from the census being—1871, 3,254,260; 1881, 3,834,194; 1891, 4,232,118; that, moreover, the late Metropolitan Board of Works took in the drainage of Hornsey, and the Council that of Tottenham and Wood Green, and that under the West Ham Corporation Act of 1893 the Council has further to provide for the drainage of West Ham, the population of which is about a quarter of a million persons. From these figures the Engineer argues that the whole main drainage system is gradually becoming insufficient for its work, and can no longer accommodate the smaller falls of rain, or at all events discommode the same without flooding, and without overflow into the Thames. Referring to the original provision for a quarter of an inch of rainfall per 24 hours, we are informed that much ampler provision for rain-water is usually included in modern sewage works. For instance, Bradford provides for 4 in. per 24 hours; Bristol, 1 in. per 24 hours; Hanley, 2 in. to 3 in. per 24 hours; and Leicester, 2 in. per 24 hours. In Liverpool there are only two outfall-sewers which give any trouble, one of which discharges 4 in. and the other 12 in. in 24 hours. In Manchester half-an-inch of rain per 24 hours is provided for, and this is now found to be inadequate; Nottingham 1 in. in one hour; Sheffield new outfall '4 ft of an inch per 24 hours; and West Bromwich 1½ in. in 24 hours. To give an idea of the increased quantity of sewage which has now to be provided for, the Engineer informs us that since March, 1889, about twenty-three miles of new brick sewers have been constructed, and ninety-four miles of pipe-sewers of various dimensions, and that during the same period there has been an increase of 30,000 houses in London. Speak-

ing generally, it may be said that the increase is at the rate of 5,000 houses per annum, without taking into account the re-erection of old buildings. It may be mentioned that in the year 1894-5 a provision was made in the Council's Money Bill for the expenditure of 150,000*l.* to meet the cost of the contemplated works, and a similar provision was made in 1895-6 for an outlay of 75,000*l.* Having carefully considered the proposals contained in the joint report, we feel compelled to recommend to the Council that works of an extensive character should be undertaken to improve the main drainage on the north side of the Thames. The first proposal we have to submit is the increase of the sewer accommodation between Old Ford and Barking. At Old Ford, where the high and middle-level sewers from a junction, they have a united discharging capacity of about 39,000 cubic feet per minute, while the double line of sewer from Old Ford to Abbey Mills which receives their contents has a discharging capacity of only 22,000 cubic feet per minute; consequently the discharging capacity of this portion of the outfall sewer is too small by 17,000 cubic feet per minute. Again, at Abbey Mills the discharging capacity of the double sewer from Old Ford to Abbey Mills together with that of the low-level sewer amounts to 36,300 cubic feet per minute, while the discharging capacity of the three outfall sewers, which extend from Abbey Mills to Barking, is only 33,000 cubic feet per minute; consequently there is a deficiency of 3,300 cubic feet per minute, or, taking into account the deficiency which as already pointed out exists at Old Ford, we find that the discharging capacity of the outfall sewer, as compared with the united discharge of the high, middle, and low level sewers, is deficient to the extent of 20,300 cubic feet per minute. The Engineer has drawn our attention to the fact that the existing outfall sewers from Old Ford to Barking have never been inspected internally since they were constructed over thirty years ago. They are constantly so charged both night and day that it is impossible to examine them, and he is of opinion that as there are many important iron aqueducts on this line they should be inspected periodically. It is only by the construction of the proposed new outfall sewers that any change can be effected. Acting under the resolution of the Council of April 14, 1891, the Engineer has prepared and submitted to us 100 working drawings of the proposed additional outfall sewers from Old Ford to Barking, or a distance of about 5½ miles. The Engineer proposes that there should be two 9 ft. by 9 ft. sewers side by side with those already existing on the northern outfall sewer embankment, but after considerable discussion we have come to the conclusion that the expenditure may with advantage be spread over a longer period by first constructing one only of the suggested sewers, together with the bridges which will be necessary at various places should the Council hereafter decide to make the second sewer. Sir Benjamin Baker and Mr. Binnie in their joint report estimate the cost of the two sewers at 620,000*l.*, but the cost of one sewer only with the other additional work above mentioned will, we are informed, be roughly 450,000*l.* We should, however, point out that, as the quantities have not been taken out, this estimate is only a preliminary one, and may have to be considerably varied after the actual measurements have been made. We recommend—

"(a) That one additional outfall sewer 9 ft. in diameter be constructed between Old Ford and Barking, together with the necessary bridges to carry another sewer of similar capacity, and that the Engineer be instructed to have the working-drawings prepared and lithographed and the quantities taken out, with a view to exact estimates of the cost being prepared and to the work being put in hand with as little delay as possible."

We now come to the second proposal, viz., the construction of a new main intercepting sewer from Paddington to Old Ford. In connexion with this we would point out the rapid growth of the population in the Northern and North-Western suburbs of London, and in that part of Willesden which must in the course of nature drain into the metropolitan system (quite excluding the Brent area), and the Engineer states that some provision must be made by the construction of a new intercepting sewer to prevent this drainage flowing down the Countess's Creek, Brook Green, and Stamford Brook sewers into the district of Fulham and Hammersmith, which are already in a most unsatisfactory condition. Referring to the thirty-seven storm outlets into the Thames and Lea, and basing our figures on the observations made during the last five years, we may assume that they always overflow when the rainfall amounts to one-tenth of an inch per 24 hours; that this causes about 1,550 discharges into the Thames and Lea annually, and that these discharges range from an average of 201 hours to 78½ hours each per annum among the various overflows. In other words, we may say that each storm outlet overflows in times of small rainfall for an average period of ten days every year. Again, the main low-level sewer was surcharged thirty times during 1892, forty-five times during 1893, and 116 times in 1894, these surcharges varying from a few inches to 18 or 19 ft. above the top of the arch. The Engineer further points out that besides the above flood-discharges there are times when the low-level sewer can only perform its work by turning the whole of the crude sewage pumped at the western

pumping-station into the Thames at Pimlico. This has had to be done on an average fifty times each year for an average of 386 hours per annum. It should also be noted that the middle-level sewer which extends along the Baywater-road, Oxford-street, and Hart street to Old Ford is too small for the work it has to do, and that there are many overflows from it into the low-level sewer. Having regard to the frequency of the surcharging of these sewers, we are of opinion that a new intercepting sewer from Paddington to Old Ford should be constructed so that the stormy waters from the higher levels may be intercepted and conveyed to the outfall instead of being made to pass into the sewers in the low-level areas, thereby causing the flooding of premises in the low-lying districts and the discharge of sewage into the Thames. The low-level sewer, then become more expable of relieving the districts which it was intended to drain. It should be noted that in many of the districts which suffer from the surcharging of the sewers the floodings are in no way due to the height of the tide in the river. For instance, a part of the Parish of St. Marylebone where floodings are complained of in times of 2½ miles distant from the river, and the sewer is about 42 ft. above Trinity high-water mark, and the Vestry urges that the construction of a relief sewer should be at once proceeded with. Similarly, in the case of the north-eastern part of Holloway, viz., Crouch Hill, we have before us at present an application from the Vestry of Islington for sanction to the construction of a relief sewer, but as this would have the effect of bringing the sewage into the sewer at Hackney, which is already surcharged in times of heavy rain, the Engineer advises us that unless further provision is made by the construction of a new main intercepting sewer it would be injudicious to sanction the proposal of the Vestry. Under the circumstances here stated we cannot but advise the Council to construct another intercepting sewer in the manner proposed in the joint report. The Engineers suggest that the sewer should commence at Paddington north of the Harrow-road and the canal basin, by a junction with the Ranelagh sewer, which is greatly overtaxed in times of rainfall, and pass along the north side of the Metropolitan Railway by Euston, St. Pancras, and King's Cross Stations to Old Ford. This sewer, if constructed, would, in addition to relieving the higher districts through which it would pass, give immense relief to the existing middle-level sewer, and in its turn the low-level sewer. The cost of this intercepting sewer was estimated in the joint report at 25,000, but this estimate, as in the previous case, must be considered as approximate only. We recommend—

(b) That an intercepting sewer be constructed from Paddington to Old Ford, and that the Engineer be instructed to prepare the necessary specification, plans, and estimate of the cost of the work.

Besides the above works, which deal generally with the drainage of London north of the Thames, the Engineer has pointed out to us certain other works of smaller magnitude and of a more local character which are urgently required. These are, first, a deviation of the sewer which passes under the main outfall at Old Ford, so as to prevent its too frequent discharge into the river Lea at that point; secondly, the erection in Lots-road, Chelsea, of a centrifugal pumping-station with gas-engines, to discharge direct into the Thames the water brought down from the higher grounds by the Counter's Creek sewer during periods of excessive rainfall; and, thirdly, the erection of a similar centrifugal or other pumping-station on the bank of the river Thames, near the gas-works at the termination of Imperial-road, Fulham. This will have the effect of preventing the local floodings so frequently complained of, and which it is feared may be somewhat intensified when the new sewer from Hammersmith to Valhamb Green, now in course of construction, is completed. It is probable that these three works, when proper plans and sections are taken out, will cost not much less than 50,000. We recommend—

(c) That the relief works above mentioned be carried out, and that the Engineer be instructed to prepare the necessary plans and estimates of the cost.

Mr. McDougall moved the following amendment: "That the general enlargement of the main drainage system is not necessary, but that local floodings need immediate attention." He said that, in 1889 the Thames was a dirty, stinking, and filthy ditch, while to-day it was clean and full of fish. The real question was, How were they to prevent flooding? New sewers would have no effect upon flooding, which came about through houses being built below Trinity high-water mark. Pumping-stations could do something to remedy the evil, and it was on such works that money should be spent, rather than on an enlargement of the system.

Mr. Idris seconded the amendment, observing that stormflow contained practically no sewage. Seeing how black it was, he analysed samples, and found that the discoloration resulted from London soot. Not only was the expenditure on the proposed new sewers totally unnecessary, but it would be actually mischievous, because, if the sewers took a larger quantity of liquid down to

Barking than at the present, there would be no way of dealing with it all, and some would have to go unpurified into the river.

Mr. Burns, M.P., contended that the time had come when additional trunk sewers were absolutely necessary, the existing ones being now overtaxed, owing to the growth of population and the increased use of water for sanitary purposes. Mr. McDougall admitted the great improvement that had taken place in the state of the river—an improvement, by-the-bye, largely due to the diversion from the river to the sewers of the poisonous chemicals used in the riverside factories—but Mr. McDougall ought also to know that the margin of efficiency of the new works carried out by the Council five years ago had now been reached.

Mr. Emden advocated the provision of an independent system to carry off the rainfall.

Dr. Gooding stated that when a sewer was empty, or practically empty, it became a reservoir of sewer-gas and spread disease far and wide. Although therefore flooding was an evil, sewers that were not adequately used were a worse evil.

On a show of hands the amendment was carried by 55 votes against 18.

Dr. Longstaff moved the following addition to Mr. McDougall's motion: "And that the Main Drainage Committee be instructed to bring up a report showing in detail the result of the several works carried out by the Council with a view to relieve the main drainage system."

With this addition Mr. McDougall's motion was adopted in a substantive form. Recommendation (c) in the Committee's report was then carried.

The Council having transacted other business adjourned soon after seven o'clock.

THE SMITHFIELD CLUB SHOW.

The annual Cattle Show which was opened on Monday at the Agricultural Hall, Islington, and which closed yesterday (Friday), is the 98th which has been held by the Smithfield Club. The reason for even a brief notice of such an exhibition in an architectural journal may not at first be apparent, but when we state that the Cattle Show, like all the exhibitions held at the Agricultural Hall, is not exclusively limited to live and dead stock exhibits, or even to implements and articles used on the farm or in connexion with agricultural work, but includes many exhibits of a miscellaneous character, some of which come within our province, the reason for a short notice of some of those exhibits will at once be seen. We may remark, however, that it is not a little surprising that some exhibitors should find it worth their while to show their goods, year after year, at all these class-exhibitions, but we suppose they do, or they would not be represented; and certainly any inoffensive means of bringing before the public interesting and useful exhibits cannot be regretted.

At the time of our visit the exhibition was in a very forward state, and a catalogue was on sale. The whole of the building has been given up to the exhibits, and all available space has been utilised for that purpose. In the centre of the ground-floor most of the animals are to be seen, and under the galleries is placed the heavy machinery, consisting of traction engines, gas and oil engines, machines for all kinds of agricultural purposes, as well as carts and wagons used on estates and farms. The principal exhibitors of traction and other engines were Messrs. Tanges, Limited, Birmingham; Marshall, Sons, & Co., Limited, of Gainsborough and London; Robey & Co., Limited, Lincoln; R. Hornsby & Sons, Limited, Grantham; Ruston, Proctor, & Co., Limited, Leeds; John Fowler & Co., Limited, Leeds and London; J. & F. Howard, Bedford; Ransomes, Sims, & Jefferies, Limited, Ipswich; E. S. Hindley, Bourton, Dorset; Wallis & Stevens, Limited, Basingstoke; Chas. Burrell & Sons, Limited, Thetford; Aveling & Porter, Rochester; Crossley Bros., Limited, Manchester; Clayton & Shuttleworth, Lincoln; Robinson & Ander, Limited, Wantage; J. & H. McLaren, Leeds; W. Tasker & Sons, Andover; R. Garrett & Sons, Suffolk; Weyman & Hitchcock, Limited, Cheltenham; Brown & May, Devizes; W. Foster & Co., Limited, Lincoln; Barrows & Co., Limited, Banbury; Holmes & Sons, Limited, Norwich; W. Allchin, Northampton; E. Humphries & Co., Limited, Pershore, and others. On the same floor Messrs. Humphreys, Limited, Knightsbridge, showed a small model of their corrugated iron buildings.

The Cork Pavement Company, St. Helens, E.C., had a stall in what was called the Bazaar,

showing specimens of their cork bricks for paving. The bricks are made of granulated cork mixed with bitumen, and are then pressed into the required shape. The bricks are said not to be affected by heat, and, judging from specimens exhibited, which have been in use for over two years at Liverpool-street, they wear well. Provided they are not more costly than wood blocks, there is no reason why the bricks should not be extensively used, for they are non-absorbent, comparatively noiseless, and afford a good foothold to horses or pedestrians.

The Station Indicator Company, of St. Helens-place, showed a model of the indicator which they have fitted on some of the District trains. The method seems a good one, and we hope it will, with some improvements, be adopted on all our railways. The one objection we have to the system is that the station names do not appear alone on the indicators, but are surrounded by the inevitable advertisement.

Messrs. McDowall, Stevens, & Company, Limited, Upper Thames-street, had a stall in the arcade entrance showing their stable fittings, kitchen-ranges, stoves, and hot-water apparatus. The stable fittings were shown in the form of a small model stable.

Mr. Sam Deards, of Harlow, was represented as usual by the "Little Samson" hot-water heating apparatus, and a model of his patent glazing without putty, lead, &c.

The Eagle Range and Foundry Company, Limited, Regent-street, showed their ranges and grates, a special feature in one of the ranges being an annealed glass oven-door, with the usual iron door in front.

Among other exhibits we may mention those by Messrs. F. Morton & Co., Limited, Liverpool, (iron roofs, &c.); F. Jones & Co., Kentish Town (silicate cotton or slag wool for insulating purposes); the Pickering Block and Hoist Co., Clerkenwell (light hoisting machinery); Messrs. Hill & Smith, Brierley Hill (iron fencing and roofs); Mr. J. W. Titt, Warminster (galvanised steel wind engine, with riveted angle steel tower); and Mr. C. G. Roberts, Haslemere (patent rain-water separator).

ARCHITECTURAL SOCIETIES.

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING SOCIETY.—The last meeting of this Society was held on the 5th inst., when Mr. W. Pogson delivered a lecture on "The Design of an Iron Roof," in the Town Hall, Carlisle. The roof dealt with was 60 ft. span straight rafter roof, 15 ft. rise with slated covering. The weight to be carried by the truss was taken at 20 lbs. dead load and 30 lbs. for wind pressure, allowing for a horizontal wind pressure of 50 lbs. per square foot. The rise of tie-rod allowed was 1-30th of span, which, though decreasing the depth, and therefore the strength, was advisable on account of the better appearance the truss assumed, and on account of the shortening of the struts. For a rough estimate of the cost of a roof the practical method was to take the strains out on all the members, and to obtain the weight of iron in the structure by dividing the strain on the tension-members by 4 tons, and on the compression-members by 2½ tons. The lecturer then described the method of taking the strains graphically, after which the details of connections were described. The lecturer was of opinion that 75 of diameter of rod it connected was the best size for a connecting-pin. If welded joints formed part of any member twenty per cent. extra strength should be allowed. Wind-bracing was little needed, but if used the rule was to take one-eighth in. for every 10 ft. of span and add one-fourth in. for the diameter of the wind bracing rods. A vote of thanks to the lecturer concluded the proceedings.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A paper on the subject of "Modern Decoration" was read on the 9th inst. before the members of the Leeds and Yorkshire Architectural Society, by Mr. Francis D. Bedford. In the course of his remarks the lecturer declared that art had never suffered so much from comparison as at the present time, in consequence of the whole world being so easy of access. The admiration for the past was governed to a great extent by sentiment. Their work should never ignore the age they lived in, but rather interpret the hidden beauties that lie all around. It was no doubt difficult in the present age for an artist to retain the spirit which moved him, and harder still to put it forth. Competition was so keen, and competition was the destruction to art. Far too many artists now-a-days expressed themselves in a past language or a present, because they had

no language of their own. In architecture and its branches they saw as much of what should only have been the model. There was too much of the note-book in most buildings. English art had derived a great and never-to-be-forgotten benefit from those who in the earlier part of the century by their writings told them of the spirit which animated the work of their forefathers. But let them remember there was no such thing as a revival—no such thing as the restoration of a force long since spent. In such attempts they were false both to the past and to the present, and that begot a confusion which was worse confounded. They must be true to the present, and to it wed themselves heart and soul, strengthened with the lessons taught by the past—a past which had reached them slowly, and must be carried on in the same gradual way. It was to nature they must turn, not to museums. Nature would restore all things, and the study of it should be seen in all they designed. What the painter said in colour the decorative artist did in line. The divorce between colour and line when natural was asounding, but when it arose from sheer indolence it was deplorable. The lecture was illustrated by a number of designs for stained glass, wall-papers, furniture, and mural decoration. Mr. Dodgshun, President of the Society, was in the chair.

LIVERPOOL ARCHITECTURAL SOCIETY.—A paper, entitled "Some Thoughts on Old Furniture," was read on the 9th inst. by Mr. Guy Dawber, in the Law Library, Union-court, Castle-street, Liverpool, at the third ordinary meeting of the forty-eighth session of the Liverpool Architectural Society. Mr. Alfred Culshaw, President of the Society, occupied the chair. The leading features in the designing of furniture by Chippendale, Sheraton, and others of bygone and more recent times were reviewed by the lecturer.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of the members of this Society was held on the 10th inst. at the Sheffield School of Art, Mr. C. Hadfield, President, in the chair. An interesting lecture on "Norman Architecture" was delivered by Dr. H. C. Sorby, F.R.S., who is an honorary member of the Society. The lecturer gave a short account of the pre-Norman style in England, and exhibited lantern-slides of some of the most striking remains. He then showed a few illustrating the architecture in Normandy at about the time of the Conquest, and about twenty years older than the earliest Norman buildings in England. These are chiefly characterised by the extremely simple character of their ornaments; but amongst these is one called the tau symbol, which is very interesting, on account of its being derived from the Egyptian symbol for life, used commonly at least 4000 B.C. The lecturer then exhibited and described slides prepared from some of the chief buildings in England, illustrating the gradual increase in ornamental details and the introduction of many of new character, until when we arrive at about 1170 a very rapid change occurred, so that in the course of the next twenty years scarcely any trace of the old Norman style remained, and the so-called Early English style became fully established. During the previous one hundred years the amount of progress was most extraordinary. A cordial vote of thanks was accorded to the lecturer, on the motion of Mr. J. Smith, seconded by Mr. J. T. Cook, and supported by Mr. C. J. Innocent and Mr. J. K. Wigfull. A number of nominations for membership were read, upon which ballots will be taken at the next meeting.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The third meeting of the session of this Association was held on the 4th inst., at 32, Sackville-street, Piccadilly, Mr. C. H. Compton, Vice-President, in the chair. The Rev. Cave Brown, M.A., read a paper entitled "The Isle of Purbeck and its Marble," in which he traced the history of the isle and the origin of the name to Saxon times. It was a Royal warren according to Lambarde. A vivid description of the general aspect of the locality at the present time was given, and the method of quarrying the stone, and more especially the famous marble, so highly esteemed for its beauty during the Middle Ages, was clearly explained. The author drew attention to the discovery, about two years ago, of an unsuspected layer of the marble, similar in every respect to that used so largely in our cathedrals and churches throughout the country in the thirteenth and fourteenth centuries. An interesting description of the local

customs of the workers in the quarries, and of their guild, and the ancient charter once possessed by them, dating from the days of the early Edwards, but destroyed in a fire at Corfe Castle, was given. A reputed copy of this charter, however, exists, also articles of agreement dated 1557, under which the "marblers" still monopolise the right of working any quarry. Some specimens of the new marble illustrated the paper. In the discussion which ensued, Dr. Brushfield pointed out that the marble was known to and used by the Romans at Chester; he also described the geological formation. Some Roman tesserae, found at a depth of 17 ft. below the surface in Bishopsgate-street during some recent excavations, were exhibited. Mr. K. Quick, the Curator of the Horniman Museum, afterwards read a short paper descriptive of an ancient Celtic bell and other bells from various parts of the world which he produced for exhibition. The Celtic bell was discovered in the year 1888 in an old farmhouse at Bsbury, four miles from Ledbury, in Herefordshire. The bell measures 10½ in. in height, without the handle, and is 7 in. long and 2½ in. wide; the handle is 3½ in. high. Altogether the bell weighs 5 lbs. 6 ozs. It is made of one piece of iron one-sixteenth of an inch thick, folded on itself in the middle, forming in plan a right-angled figure, widening towards the bottom or mouth, the edges turning inwards and overlapping each other. The bell appears to have been dipped into melted bronze. It, no doubt, was used by the Celtic church, and is probably of the sixth century. The Chairman, Mr. Patrick, Hon. Sec., and Mr. Barrett took part in the discussion which ensued.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution, held at the Westminster Palace Hotel on the 6th inst., Mr. H. B. Vorley in the chair, the paper read was on "Urban Roads and Footways, with Notes on Gas, Water, and Electric Mains, &c., in connexion therewith," by Mr. J. Julian, of the Borough Engineer's Office, Cambridge. After a few preliminary remarks as to the original laying out of roads, the author considered their formation as executed principally by local authorities before taking them over. In macadamised roads it was more economical to strengthen the foundation than to use a thick layer of other material between foundation and surface. The materials employed for foundation, and to a somewhat lesser degree for surface, were shown to be governed by local circumstances. Examples of cost in three localities amounted to practically the same per yard super.—4s. 3d.—but the problem in most places was perhaps to produce a road as good as possible for a fixed figure, the various items varying considerably. Details were also given of the total cost per yard super. of pavings on concrete foundations—viz., granite, 11s. 9d.; hard wood, 15s.; and asphalt, 11s. The limiting gradients in ordinary cases were: asphalt, 1 in 60; wood, 1 in 25; macadam, 1 in 20; and granite, 1 in 15; but there were instances of macadam roads as steep as 1 in 6. Channelling, kerbing, and paths were then dealt with, and the common roadwork section of the paper concluded with some figures as to the covering capacity of stone and quantities of granite to the ton. Proceeding then to consider the laying of tramways, it was shown how great was the proportion which the roadwork bore to the other expenses of tramway-track construction. A brief description followed of the overhead and conduit electric and the mechanical cable systems; and the underground works of a road were then reviewed. Various modes of laying electric mains were described, and particulars were given as to cost and of methods for determining the size of conductor and other data. Water and gas-mains were then noticed, and with reference to them the author presented several formulae for obtaining first approximations. Details of joints were illustrated, while an estimate for laying a pipe-main showed the importance of taking into account the cost of restoring the road surface. Attention was next directed to hydraulic, pneumatic, and steam-powered mains, and after some remarks on pipe-laying generally, and reference to last winter's frost experience, the question of sewers was considered. Figures of cost illustrated how widely these varied in practice; a 12-in. pipe sewer 9 ft. deep was, according to one estimate, 3s. 7d. per ft. run, whilst another amounted to 5s. 3d., no new surface material being used in either case. In the discussion which ensued, Messrs. R. W. Newman, E. A. Berry, C. Mittelhausen, S. Boulding, F. Fisher, W. R. Beckton, W. Cooke, and the Chairman took part.

SOCIETY OF ENGINEERS.—The forty-second annual general meeting of the Society of Engineers was held on the 9th inst. at the rooms of the Society, 17, Victoria-street, Westminster, S.W. The chair was occupied by Mr. William George Peirce, President. The following gentlemen were duly elected by ballot, as the Council and Officers for 1896, viz.:—as President, Mr. Samuel Herbert Cox; as Vice-Presidents, Messrs. Chas. C. Carpenter, G. Maxwell Lawford, and W. Worby Beaumont; as Ordinary Members of Council, Messrs. Joseph Bernays, George Burt, John C. Fell, Chas. Gandon, Percy Griffith, Chas. Mason, Henry O'Connor, and Stephen Sellon; as Hon. Sec. and Treasurer, Mr. Perry Fairfax Nury; as Hon. Auditors, Messrs. Alfred Lass, F.C.A., and Samuel Wood, F.C.A. The proceedings were terminated by a vote of thanks to the President, Council, and Officers for 1895, which was duly acknowledged by the President.—The forty-second annual dinner was given at the Holborn Restaurant on the 11th inst. The President, Mr. William George Peirce, occupied the chair. After the usual toasts of "The Queen," "The Prince and Princess of Wales," and "The Navy, Army, and Auxiliary Forces," the President, in reply to the toast of the evening, viz., "Success to the Society of Engineers," said that the papers read at their ordinary meetings had been well and carefully prepared, and on most interesting subjects, comprising—Parliamentary Procedure as affecting Light Railways and Tramways, Portland Cement, Street Subways, Safety Appliances for Elevators, Relative Value of Percolation Gauges, Statistics on the Strength of Railway Axles, and Ventilation and Warming, and all the papers evoked good discussions. The President then dwelt upon the value of belonging to scientific societies, and said that much valuable experience could be gained by belonging to these where opportunities were freely given to the members—both old and young—to take part in the discussions on the papers read at the meetings. The summer vacation visits to engineering works had been of great interest, comprising the City and Waterloo Railway Works, the City of London Brewery, the Outer Harbour Extension Works and the Electric Lighting Works at Dover, and the School of Gunner, Shoeburyness. All of these had been well attended, and these visits had proved most beneficial to all who took advantage of the invitation to join in them. Lastly, the President advised all the younger members of the profession to take advantage of the opportunities offered by the Society both at ordinary meetings and at the vacation visits to engineering works, for although the modern technical educational establishments did a great deal there was much to be learnt in actual workshop experience and at visits to works in progress. Other toasts followed.

TRADE CATALOGUES.

THE Berlin Photographic Company send us a catalogue of their extensive list of photographs or photogravures taken from paintings by eminent artists, with some sheets of illustrations on a small scale. They also publish, at a higher rate than black and white photogravures, facsimile gravures, printed from the same copper-plates as the black and white, but with the colours of the original painting rubbed on to the plates, so that an approximate facsimile is produced.—Messrs. George Farmiloe & Sons send us a large catalogue of sanitary work, including their improved sloop hopper in fireclay, for hospitals and hotels; various stoneware traps, including Weaver's ventilating sewer-air trap and Sykes's patent sewer-gas interceptors; channel bends and junctions; the "Eclipse" drain-testing apparatus, and drain-cleaning appliances; soil-pipes, ventilators, boiler safety-valves (mostly, we are glad to see, dead-weight valves—springs are not to be trusted); cisterns, sanitary dustbins &c.; electric-bell fittings; portable forges and tools, lead-piping, &c. &c. Some additional interest is given to the catalogue by illustrations and accounts, under the heading "Trade Curiosities," of ancient work, "manufacture of lead in 1742," for example. There is also an extensive catalogue of glass and glass-leading.—Messrs. Ridley & Sons send us a large catalogue of priced and illustrated sections of wood mouldings.—Messrs. J. Duckett & Son send us a catalogue of cottage water closets and latrines to be flushed with slop-water, and automatic tips for flushing sewers and drains; a useful catalogue, illustrated with complete sections and other drawings.

THE STUDENTS' COLUMN.—Owing to pressure of other matter, we are compelled to hold over our usual "Student's Column" article until next week when two chapters will be given.

Correspondence.

To the Editor of THE BUILDER.

FIREPROOFING TIMBER.

SIR.—The by-laws of Town and District Councils forbid erections in wood, even on open sites, when such buildings would be so far removed from others as to preclude any possibility of danger. Were it possible to render the wood to some extent unflammable, this restriction, which is often a needlessly hampering one, could be dispensed with. I should be very much obliged to any of your readers who could tell me whether practical use, on anything like a large scale, has been made of any of the preparations brought out in recent years for the protection of wood from fire.

Experiments, I know, have been made on the part of the patentees with picking-cases or small huts, but that is hardly enough for my purpose. BAL TIC.

OBITUARY.

MR. C. T. LUCAS.—The death has just occurred of Mr. C. T. Lucas, of Warham Court, Horsham. The deceased was the senior partner of the firms of Lucas Brothers, Lucas & Aird, and John Aird & Sons. He was born in London in 1820, and on fifty-three years ago began business at Norwich as a builder and contractor. Some time afterwards he was joined by his brother—now Sir Thomas Lucas—and founded the firm of Lucas Brothers at Lowestoft. Their business increased to such an extent that they were eventually removed to London, and grew into the three concerns already mentioned. Among the many important works carried out by them were the Royal Albert Hall, the Charterhouse Schools at Godalming, the South Kensington Exhibition of 1871, and the Royal Albert Docks. About twelve years ago the deceased restored the Palace church at Warham at a cost of several thousand pounds, to which fact a brass plate on one of its walls bears evidence.

GENERAL BUILDING NEWS.

FREE LIBRARY, EVERTON.—The Liverpool Corporation are building a new Free Library at Everton, in the suburbs of the city. The design is by City Architect, Mr. Thos. Sheldermire, Messrs. Paterson & Son are the builders, and the floors are fireproof on the "Mark Fawcett" system.

NEW BRIDGE OVER THE WYE, AT SELBACK.—The scheme for the erection of a bridge across the River Wye, at this place has been on foot for upwards of two years. The original idea was to erect an iron girder bridge of three spans, but this would have necessitated the erecting of two stone piers in the river bed; whereupon the Rev. Augustin Ley consulted Mr. Ernest Davies, architect, of Hereford. Acting upon his advice the first scheme was abandoned in favour of a suspension bridge of one span. The stone used in the abutments of the bridge has all been quarried in the locality, and is a hard red sandstone. The foundations are about 15 ft. deep, and sunk below the bed of the river on a good firm bottom on the rock, and are composed of concrete and gravel out of the river. The masonry abutments are of solid stone, with Forest of Dean coping. Two smaller abutments carry the approaches on either side, and the roadway is made up with gravelled surface. The two anchor blocks for holding down the bridge are of cement concrete, 13 ft. square, in which the links and rails are thoroughly embedded. The bridge has a clear span of 100 ft. (the water-line being 150 ft.), and a total length of 228 ft. and 6 in. wide, being intended for foot traffic or for cattle only. On either side of the river are two cast-iron ornamental columns, surmounted with finials for carrying the ropes which pass over the columns, and are made of best patent improved galvanised steel wire, 5 in. in circumference. The two suspending ropes have each a breaking strain of 35 tons, and the platform ropes are 3½ in. round, and have a breaking strain each of 40 tons. These are secured to the anchor blocks, and strained up with nuts and bolts. Every 2 ft. apart there are placed vertical rods connecting the upper and lower ropes. The rods are of solid steel, galvanised, with a breaking strain each of 14 tons, and are fixed to the sides of the bridge. The flooring and skirting are of oak, and are bolted down to the ropes. The sides of the bridge are protected by lattice wire panelling, fixed to the vertical rods and skirting. The approaches on each side are carried by oak beams, with iron railings at the sides and gates at the entrance to the bridge. The screws, nuts, and tightening apparatus have all been cased in so as to be protected from the weather. The walking-way of the bridge is asphalted, and all the timbers have been well tarred throughout to prevent their decay. The bridge has a slight camber—about 3 ft.—and the underside at the centre is about 25 ft. above the summer level, and about 6 ft. above the great flood in the year 1852. The steel and ironwork of the bridge was supplied by Mr. Louis Harper, of Aberdeen. The masonry, concrete-work, and flooring has been carried out by Mr. John Preece, contractor, of Marden. The erecting was entrusted to Messrs. Naylor & Co., engineers, Hereford. The whole of the work has been carried out under the superintendence of the architect, Mr. Ernest G. Davies.

THE PROPOSED NEW POLICE BUILDINGS, COVENTRY.—At the meeting of the Coventry City Council on September 24 it was resolved, "That the plans for municipal buildings, to which the first premium was awarded in the recent competition, be referred to the consideration of the Estates and Finance and Watch Committees jointly, with instructions to report as to the steps to be taken to provide police buildings, under pressure from the Home Office, have been engaged upon the question of bringing the scheme into practical shape. As at first arranged, it was found that to carry on the police portion of the scheme would involve the erection of about three-fourths of the whole proposed new municipal buildings. With a view to obtaining the necessary police accommodation at less expense, a sub-committee was delegated to confer with Mr. H. Quick, the architect, and as a result a re-arrangement of the plans has been made by which police accommodation may be provided at a cost of about 8,000 £. upon the site of the present police-station. No difficulty is anticipated in accommodating the police temporarily, during the progress of the work.—*Coventry Herald.*

RESTORATION OF PARISH CHURCH, THELNETHAM, SUFFOLK.—On the 1st inst. the old parish church of St. Nicholas, Thelnetham, was reopened after restoration. A Spanish chestnut roof has been placed on the chancel, covered by stone slate. The walls of the chancel have been restuccoed. Fresh stone tracery has been placed in the window by the pulpit, the north stone doorway replaced in its former position, and the flooring under the benches in the nave and Lady Chapel, which was decayed, have been replaced by fresh floors. All the windows have been constructed for the ancient stone altar slabs, the frames being made of red pollard oak from Coney Weston Park. The two east windows of the chancel and Lady Chapel have been restored also, and the large window in the Lady Chapel reglazed. Mr. W. Fawcett, of Cambridge, was the architect; Mr. R. Hogg, builder, Coney Weston; Mr. R. F. Peffitt, stonemason, Diss; Mr. T. Lebbon, bricklayer, Hopton; Mr. J. Walton, glazier, Hopton; and Mr. W. Close, the Quarries, Colley Weston, Northants.

UNITED PRESBYTERIAN CHURCH, LEITH.—What was formerly Junction-street Hall, Leith, has just been opened as a church for the Ebenezer United Presbyterian Congregation. A new platform has been constructed, with the pulpit in the centre, at the south end of the church, with accommodation in front for the choir. Galleries have been carried along both sides, and the entire building now has sitting accommodation for about 800 persons, the floor being made of pitchpine. The building has been repainted and redecorated. A hall for mission purposes has been constructed at the back for about 200 persons, the two retiring-rooms behind the old platform having been made into one for the purpose. The main entrance is, as before, from Junction-street, with a side access from Bowling Green-street. The architect was Mr. W. N. Thomson, Leith.

BAPTIST CHURCH, MOTHERWELL, LANARKSHIRE.—A new Baptist church was opened at Motherwell on the 8th inst. The new church is situated at the junction of Lochend-street with Windmill-street, and has been built from the designs of Mr. Alexander Cullen, Motherwell. The building is of red sandstone, with a simple treatment of the friesshrie, and the style is a simple treatment of Romanesque. Accommodation is provided for 370 sittings, with baptistry, and the necessary retiring-rooms and vestry.

NEW ASSEMBLY ROOMS, BIRMINGHAM.—New Assembly Rooms are now being erected in Hurst-street, Birmingham. Considerable progress has been made with the work since it was commenced from the designs of Messrs. Essex, Nichol, and Goodman. On the ground floor will be a supper room, 75 ft. by 40 ft. At either end will be cloak rooms for ladies and gentlemen, and a drawing room, measuring 40 ft. by 23 ft. Above the supper room, on the first floor, will be the ball room of 71 ft. by 41 ft., and 28 ft. high, with attendant drawing and cloak rooms. The supper and ball rooms will be the two principal apartments, but there will be many others of minor size. The whole building will be lighted by electric light. The main entrance, which opens into a wide hall, will be in Hurst Street, but a second entrance in Inge Street will also lead to the supper room. The ball room will be approached by an extensive staircase. The feature of the facade is a tower, which has been erected over the principal doorway.

WELSH CHURCH, ABERAVON.—The Bishop of Llandaff has just dedicated the new St. Tello's Church, Aberavon. Plans were prepared by Messrs. Thomas & James, architects, Port Talbot and Bridgend, and the contract was let to Messrs. J. & S. Rees, of Aberavon. The new church consists of nave, chancel, and vestry. The walls are built of native stone, with Bath-stone dressings. The nave is lighted by lancet-headed lights, and in the west end is a five-light window with tracery bands, the whole being filled with tinted cathedral glass. Accommodation is provided for 200.

EXTENSION OF TRAINING COLLEGE, SWANSEA.—The extension of the Swansea Training College for female pupil teachers, which has taken the form of a new common room, has just been opened. The

room is 45 ft. long by 25 ft. wide. Mr. Goodrich was the builder, Mr. Portsmouth the architect.

PREMISES, NEWCASTLE-ON-TYNE.—New premises for Messrs T. & G. Allan have been erected in Blackett-street, Newcastle. The building has been built by Mr. Thos. Westbitt, from plans by Mr. J. T. Cackett, architect, who was also the architect of the premises adjoining, of Goldsmiths' Hall, and some of the other new buildings in the same street.

FOREIGN AND COLONIAL.

FRANCE.—M. Dutert, architect of the Natural History Museum, has just completed the building and decorating of the new Anthropological and Palaeontological Halls in the Jardin des Plantes. These galleries are decorated with busts of celebrated naturalists, and allegorical bas-reliefs. Nearly 400 artists belonging to the Champs Elysées Salon have signed a protestation against the destruction of the Palais de l'Industrie. As M. Picard, Commissary-General of the Exhibition, is engaged in making plans for the placing of the different buildings, which will be much better arranged, and on a much larger scale, it is difficult to understand why this protestation should be got up, and one can only imagine it is the work of certain Members of Parliament, who are opposed to the Exhibition.—The new Minister of Fine Arts has decided that at the Ecole des Beaux-Arts there shall be special courses for women, and he has authorised the students of the Académie de France, at Rome, to travel in Algeria, or in the provinces, during the time of their Roman residences.—M. Hippolyte Roux, architect, has been appointed to execute the execution of an allegorical decoration for the ceiling of the staircase of the *petit Luxembourg*, the residence of the Président du Sénat.—The Pont Mirabeau has just been opened for traffic. The decorations, which have been done by the sculptor Injalbert, consist of four large allegorical subjects mounted on the fabric, with the arms of the city of Paris.—There is a notice of an interesting exhibition of the works of the painter Henri Martin, in the Galerie Mancini, Rue Taibout.—A committee has just been formed to erect a monument to the memory of Pasteur.—M. Alfred Agach, artist, and general director of the Museums at Lille, has just given his resignation on account of the want of interest manifested by the municipality in preserving the works of art.—It is announced that the old Abbey of Cîteaux is to be completely restored and opened again as an Abbey.—In the spring the statue of General Le Flô is to be inaugurated at Lesneven. It has been executed by M. Denys Puech. M. Barré has been commissioned to execute a statue of Dr. Alphonse Guérin for Plœrmel, and an equestrian statue of Du Guesclin is to be erected at Dinan.—M. Jules Grosjean, the sculptor, has furnished the model of the monument which the "Société du Souvenir Français" proposes to raise in the public square of Hericourt in memory of the Franco-German war. The monument will be five metres in height. A female figure symbolising the town of Hericourt holds in her hand the flag of France, and looks towards Alsace. On the pedestal is a bas-relief representing a dying soldier.—A society has been formed to prosecute the study of the questions connected with the formation of a navigable canal from Nantes to Orléans.—The municipality of Toulon have opened a competition for the erection of a new Savings Bank.—The death is announced of the painter and engraver Léon Garidel, at the age of thirty-nine. He was a member of the celebrated artistic family which has produced also Karl and Eugène Garidel.

AUSTRIA.—The plans for the improvement of the inner City of Vienna are now on view at the Town Hall, and show that the authorities contemplate extensive alterations.—There have been a number of petitions lately in reference to the better paving of Vienna, especially on such important thoroughfares as the Pratergasse, and we quite agree with the petitioners that the paving complained of, generally rough granite work of the worst sort, is disgraceful.—A new synagogue is to be erected at Vienna, and the foundation stone has been laid with much ceremony, as the building is to be a memorial in connection with the celebration of the fiftieth anniversary of the Emperor's reign. There will be seating accommodation for eight hundred. Herr Gartner is the architect.—The telephone service at Vienna, which was commenced in 1881 with 150 subscribers, now has 9,000 call points. About seven-eighths of the lines are, however, unfortunately overhead lines.—The Arts and Crafts Society at Vienna will probably soon have its own "house." Plans are being prepared by Herr Kirstein.

STAINED GLASS AND DECORATION.

RENOVATION OF ST. MARK'S CHURCH, COVENTRY.—On the 31st inst. St. Mark's Church, Coventry, was reopened after restoration, &c.—The work of renovation was entrusted to Mr. Johnson, and included the colouring of the walls, and the painting of a dado, with a stencilled border, the design of Mr. H. Quick. The woodwork has also been painted and revarnished. A new heating apparatus has been provided, and at the east end

within the altar rails the walls have been hung with printed canvas, supplied by Watts, of London, the designs being the work of Messrs. Bodley & Garner, executed in colours of green, blue, and gold.

DECORATION OF HELENSBURGH UNITED PRESBYTERIAN CHURCH, DUMFRIES.—This church, after having been closed for a few weeks to allow of its being repainted and redecorated, has just been re-opened. The painter work has been executed by Messrs. H. L. Anderson & Co. (with Mr. Charles Finlay as foreman decorator), the new windows by Messrs. Wm. Meikle & Co., the gas fittings by Messrs. Milne, all of Glasgow; the plumber work by Mr. John Horn, Helensburgh; and the whole work has been carried out according to the detailed drawings, and under the personal superintendence, of Mr. Alexander M. Paterson, architect, Glasgow.

FONT CANOPY, BARNET CHURCH, HERTS.—The dedication has just taken place of the new carved oak seats, tower-screen, and font canopy at Barnet Church. The font canopy was designed by Mr. J. C. Traylen, architect, of Stamford, and executed by Messrs. Harry Hems & Sons, of Exeter. It is of spiral outline, and is 10 ft. 5 in. high. All round the base of the cover there is a carved cresting, and just above, at each of the eight angles of the octagon, are canopied and crocketed niches, carved out of oak. Each niche is occupied by a statuette sculptured in the round. There are 84 carved crockets and finials. The canopy is attached by a chain, with ornamental pulleys and weights of wrought iron, to the roof of the nave at an altitude of about 44 ft. from the floor. The tower-screen measures 12 ft. wide by 10 ft. high.

WINDOW, ASHBURN CHURCH, DERBYSHIRE.—A new stained-glass east window at Ashburn Church was recently dedicated. The work has been executed by Mr. C. E. Kempe.

MISCELLANEOUS.

"TRINITY CORPORATION OF DEPTFORD-LE-STROMD."—By a mistake of the printer, Mr. Redman's letter last week on this subject was erroneously headed "Deptford-le-Stromd."

THE INSTITUTION OF CIVIL ENGINEERS.—There are thirty members and Associates of the Institution of Civil Engineers who have been on the books for upwards of fifty years. These are, in order of election, Sir Charles Hutton Gregory, K.C.M.G., Past-President; Mr. Geo. F. White; Mr. H. D. Martin; Major-General G. B. Tremereere, late R.E.; Mr. John Baldry Redman; Mr. S. B. Worthington; Mr. Edward Cottam; Mr. John Clutton; Mr. T. Dyne Steel; Dr. William Pole, Hon. Secretary; Mr. J. C. Sherrard; Mr. Peter Bruff; Colonel T. H. Sale, late R.E.; Mr. William Evill; Mr. W. L. Baker; Mr. John Boustead; Mr. William Lindley; Mr. Edward Dobson; Mr. Henry Warriner; Mr. George Henry Birkbeck; Mr. Alfred Upward; Sir John Fowler, Bart., K.C.M.G., Past-President; Mr. James Abernethy, Past-President; Mr. J. H. Pepper; the Baron Du Bois de Ferrières; Mr. Henry Hensman; Mr. W. H. Barlow, Past-President; Mr. William Shears; Mr. W. P. Marshall, and Mr. H. Wollaston Blake. Of those elected during the years 1846-50, both inclusive, there still remain Mr. Edward Woods, Past-President; Mr. E. B. Huntington; Mr. John Addison; Mr. F. C. Christy; Mr. Robert Jacob-Hood; Mr. P. J. Margary; Mr. Charles Neate; Mr. W. G. Brounger, Field-Marshal Sir Lintorn Simmons, R.E., G.C.B.; Mr. Alfred Williams; Sir Robert Rawlinson, K.C.B., Past-President; Mr. G. W. Harris; Mr. Henry Curry; Mr. J. S. Valentine; Mr. Henry Maudslay; Mr. George Arthur Bidder; Mr. Henry Robinson; Lord Armstrong, C.B., Past-President; Mr. William Radford; Mr. William Piper; Mr. William Wilson; Mr. William Sowerby; Sir Douglas Galton, K.C.B.; Sir Geo. Barclay Bruce, Past-President; Mr. Charles Christopher Carleton Baynes; and Mr. George James Munday.

RATING OF MACHINERY.—At the Middlesex adjourned Quarter Sessions held on Saturday last week before Mr. R. D. M. Littler, Q.C., Chairman, and a Bench of Magistrates, the appeal of Mr. Otto Monsted against the assessment of 1,960l. net rateable value of his new margarine factory at Southall was heard. Mr. Edward Boyle specially retained, and Mr. Humphreys instructed by Messrs. Dollman & Pritchard, solicitors to the Machinery Users' Association, were for the appellants, and Mr. Jelf, Q.C., and Mr. Ryde, instructed by Mr. Hudson, represented the overseers. The factory is new, and cost, as stated in Mr. Boyle's opening speech, nearly 80,000l. The capacity is largely in excess of the output, and owing to the unexpected insufficiency of the water supply the full capacity is not likely to be used. The Court held that cost had nothing to do with assessment for rating purposes, and would only admit evidence as to the rent which a tenant would give for the premises taking into consideration the state of the trade. Mr. Humphreys-Davies, the first witness called for the appellants, estimated the rent at 1,000l. per annum, and was supported by Mr. Elwell, F.S.I., and Mr. Walter Barrett. Mr. Ryde, who had made the valuation in the first instance for the overseers, Mr. C. F. Jones and Mr. Bradshaw Brown gave evidence in support of the assessment of 1,960l. The Court, after a long hearing, allowed the appeal with costs, fixing the rateable value at 1,020l.

ENGLISH ENGINES IN CHINA.—The first of a set of three new pumps recently forwarded by Messrs. Hathorn, Davey, & Co., Leeds, to the Chinese Engineering and Mining Company's Works at Tongshan, was started on a fine morning, December 10th, at their No. 2 shaft. A select company was invited to witness the turning on the steam. Amongst those present were the company's secretary, Mr. Tong Kai-sun, Messrs. Lo Tao-sing, Resident Administrator, and W. Wan, Mining Engineer. All being ready the signal to start was given, and the manufacturer's representative and erector, Mr. R. Buckle, turned on the steam. At the first stroke of the engine a large quantity of Chinese crackers and fireworks were ignited in honour of the occasion. The new pump is one of the latest type of the makers' differential pumping engines, with a double-acting ram of 11 in. diameter, and 4 ft. stroke; it throws 475 gallons of water per minute from the bottom of the No. 2 shaft to the surface, a distance of 300 ft. The engines referred to consist of three compound surface-condensing differential underground pumping engines, having cylinders 18 in. by 30 in. in diameter by 4 ft. stroke—each capable of raising 475 gallons per minute, 300 ft. vertically.

THE LONDON WATER-SUPPLY.—A conference of Metropolitan Local Authorities was held on the 10th inst. at the Town Hall, Kensington, to consider the desirability of legislation being promoted to secure for the ratepayers adequate control and supervision over the water-supply of the metropolis. Delegates representing sixteen local authorities were present. General C. E. Webber, R.E. (Kensington), who presided, said the question of the water-supply of the metropolis was one which presented difficulties of a most intricate character. There was in London a population of 5,400,000, of whom 1,000,000 were in the River Thames supplied 54 per cent, the Lea 27½, and wells, &c., 18. The eight water companies of the metropolis supplied on an average 28½ gallons per head per day for domestic purposes, and that used for public purposes was a little more than half that amount. With regard to the quality of the water, which had of late been much canvassed, the report of Professor Franklin, the official examiner, was most encouraging. It was necessary, whilst taking into consideration this subject, to consider where the new sources of supply were coming from. Calculating up to the year 1930, supposing there were an extension of London boundaries, there would be a population of something like 11,000,000. It was a fact, however, that the sources of the Thames and Lea had never been fully investigated and their resources never fully taxed. For the purchase of the companies between 40,000,000l. and 50,000,000l. would have to be raised. The eight London water companies had spent something like 15,500,000l. The shareholders should not be deprived of their just rights and revenues, and consequently the question of compensation would arise. They must not lose sight of the fact that out of the 15,500,000l. a very large proportion of it was underground in the shape of mains, &c., and the value of which was very deceiving. He was strongly opposed to the London County Council having control over the Water Companies, because they had too much to do at the present moment.—Mr. George Nelson Watts (Kensington) moved—"That, in the opinion of this conference of Metropolitan local authorities, it is desirable that any legislation dealing with the water supply of the Metropolis should be in the direction of the passing of an Act which, without unduly hampering the operations of the several Companies, shall provide for the supervision and control of the existing undertakings rather than for their purchase."—Mr. T. J. Liddard (Wandsworth) seconded the amendment. Mr. J. Liddard (Wandsworth) moved an amendment to the effect that a water trust be constituted, to consist of persons to be elected by the London County Council, the Corporation of London, the Thames Conservancy, and all sanitary authorities, with all powers for the necessary purchase, control, and management of the water supply.

Mr. David Laine (St. Martin-in-the-Fields) seconded the amendment, which was carried by a large majority.—Mr. W. R. Sayer (Fulham) moved a further amendment to the effect that the London County Council should have a majority of elected members on whatever Board was constituted.—Mr. Legg (Whitechapel) seconded the amendment, which was lost.—On the motion of Mr. J. Liddard (Wandsworth), seconded by Mr. R. Walker (St. Martin's), a resolution calling upon the Government to promote legislation for the carrying out of the proposal indicated in the foregoing resolution of the creation of the necessary authority was carried unanimously.—It was also decided to send copies of the resolutions to the Prime Minister, the President of the Local Government Board, and the County Council.

FINE ARTS AND INDUSTRIAL EXHIBITION AT DOUGLAS.—The Bishop of Sodor and Man opened on the 9th inst. the Isle of Man Fine Arts and Industrial Guild at Douglas. The Guild originated in a desire to encourage and foster Manx home industries. In his opening address the Bishop advised the cultivation of art, first for its own intrinsic value, and secondly from the more utilitarian point of view of enabling English and Manx people to compete with other countries in the markets of the world. In the exhibition there is a good show of oil and water colours. There is also a loan collection

tion of Manx antiquities and a model of an old Manx cottage.

DUNFERMLINE FINE ART EXHIBITION.—The fifth triennial exhibition of the Dunfermline Fine Art Association was formally opened in the Carnegie Baths, Dunfermline, on the 7th inst. Professor Baldwin Brown, in opening the exhibition, said that such an exhibition as this afforded a gratifying proof of the extent to which a love of what was beautiful in nature and in art was spread among the people of this country. Dunfermline was herself, a mother of artists, and was the seat of a famous branch of that great textile industry the productions of which might be made by tasteful design into admirable works of art. He thought they could hardly over-estimate the value of this element of art and beauty brought home to their lives in the present day by various agencies, of which an exhibition of this kind was one of the most effective. They must not, however, overrate the advantages of an exhibition of art. Art exhibitions were sometimes spoken of in somewhat extravagant terms, as if they represented the conversion of the community generally to all that was beautiful and good. He did not think that exhibitions of art were an unmixed blessing. From the purely artistic standpoint they left much to be desired, because it was impossible to take the right attitude towards works of art when one saw them crowded together, as they must necessarily be, upon the walls. One of the advantages of an exhibition of this kind was that it encouraged what was called by a very useful, if not a very elegant, term—local talent. With regard to the overcrowding of the artistic profession, he thought that every profession at the present day was overcrowded. Proceeding to speak of the fields open to the artist independent of the old fields of picture-painting and the making of statues the Professor referred to design and decoration, to black-and-white illustrations for magazines and journals, and to the advertisement poster. On the latter point he observed that advertisements in their right place were all very well, but they were not always in the right place, and they were very possible to have them in a place where they were sometimes abominations. He might say in passing that the slopes of the Calton Hill were not a place where advertisements should be exposed. The evil was becoming a very crying one in some parts of the country, and he hoped that Scotland would preserve itself from this iniquitous form of advertisement. He hoped at any rate that the railways running through the beautiful and famous scenery of Scotland would not be desecrated by having such advertisements meeting the eye on every side; and he hoped further that no artist who devoted any of his time to artistic advertisements would ever do one that was to be put in a position where no advertisement ought to be. In conclusion, he said that it was no use either painting or purchasing beautiful pictures of nature if they all the while allowed the fair face of nature herself to be marred by the unlovely works of man. He hoped he was not in this department a fanatic. He would not say that one should make a sort of general crusade against all utilitarian works, and object to any railway or other necessary structure that interfered with some beauty of nature. In the world in which we lived, in the circumstances of our time, cases would arise in which it would be necessary to yield to considerations affecting the material well-being of the community, or a part of the community, but he did think they should try to keep those cases as few as possible, and that they should scrutinise in the most vigilant manner any proposal that was made which would involve the destruction of some beautiful scene or effect of nature—whether the proposed work was a railway station, or a bridge, or a city for a railway station, or to draw off the water from a world-famous waterfall in order to supply power to aluminium works.

REREDOS, UPTON-ON-SEVERN, WORCESTERSHIRE.—The new reredos at the Parish Church, Upton-on-Severn, has just been dedicated. The background of the structure is of Fainswick stone, and the sculpture is of white alabaster. The figures in the central panel represent Our Lord and the two disciples at Emmaus, and in the panels on either side are figures of St. Peter and St. Paul, the patron saints of the church. The reredos was designed by Sir A. W. Blomfield, and the work executed by Mr. T. Collins, of Tewkesbury, the sculpture being from the studio of Mr. G. H. Martin, of Cheltenham. The drawings executed by the students of the School of Applied Art during the past season are this year hung in the galleries of the Royal Scottish Academy. On the 6th inst. the galleries were visited by the Lord Provost, Magistrates, and Council, who have, out of the Equivalent Grant from the Government, voted 1,000l. a year to its support. The members of the Corporation were received by Dr. Rowan Anderson, director of the classes at the School, and several of the Trustees of the Board, and were shown round the galleries and had the work explained to them. The School, it may be briefly recalled, was started three years ago with the view of giving a wider education in art than was then obtainable to young men and apprentices engaged in trades and professions with which art is in a greater or less degree associated. An annual sum subscribed by employers of such labour was guaranteed for five years. The Board of Manufacturers showed its sympathy in the movement by assist-

ing in the management and by giving the necessary accommodation for carrying on the teaching, while the Town Council, as already stated, generously contributed to its funds. One thing which greatly hampers the directors in the development of the School is the tentative arrangements which can only be made while it remains on its present experimental footing; but the School has met such a felt want in the city, is carried on upon so practical principles, and has been so taken advantage of by the class of students for whom it was intended, that it is hoped something will soon be done to establish it on a permanent basis. One thing very much wanted at present in connexion with it is a workshop, where the practical details of certain art handicrafts could be better taught and illustrated; but unless assisted by some wealthy citizen interested in the subject, the directors do not see very well how otherwise this requisite to their further success can be obtained. The drawings on view are largely of an architectural character. Architecture is recognised as being the basis of all good design; and affording a common standpoint for craftsmen who have afterwards, at the call of the State, to furnish and decorate in a consistent and unified way the houses of the citizens. The drawings show that the characteristics of the different orders of architecture have been well taught; the figure has also been studied to some purpose, as being so necessary in all first-class design; and last season great pains were taken to develop the study of colour for decorative purposes. A few examples of plaster ornaments are shown as the fruits of the modelling class. Last year there were in all sixty students in the different classes of the School, that being about the limit of the present accommodation. In connexion with the classes there are Saturday afternoon classes for the study of mansions and buildings, where the student sketches internally or externally whatever appeals to him as the most interesting features of the places visited. The results of these excursions are likewise seen on the walls. Last year two scholarships of 50*l.* each were founded. These scholarships have been allocated, and the possessors of them have made a beginning at Holyrood in the study and appreciation of interesting features in old Scottish furniture to be found in the ancient Royal Palace.—*Scotsman.*

LEGAL.

ALLEGED OBSTRUCTION OF ANCIENT LIGHTS AT LEEDS:

ACTION IN THE CHANCERY DIVISION.

The case of Powell v. Wedderburn occupied the attention of Mr. Justice Romer in the Chancery Division on Monday, Tuesday, and Wednesday, the 2nd, 3rd, and 4th inst., it being an action brought by the plaintiff to restrain the defendant from two hoardings which obstructed the plaintiff's ancient lights.

Mr. Oswald, Q.C., M.P., and Mr. Bardswell appeared for the plaintiff; and Mr. Eve, Q.C., and Mr. Austen Cartmell for the defendants. The plaintiffs in this case were Mr. William Powell, who carries on business as Groddall, Backhouse, & Co., wholesale chemist and druggist, at Leeds, and the defendants were Laecelot Wedderburn and Elizabeth Kenyon Wedderburn, his wife, the owners of adjoining property in Kenyon's Court, Briggate. It appeared from Mr. Oswald's statement that the plaintiffs claimed the site of an old temperance hotel, which was known as Myers' Temperance Hotel, and to which certain alterations were made in 1876. The male defendant owned the premises on the south side of the court and his wife those on the north side, but she had granted to her husband a life interest in her property. Plaintiff employed some sixty or seventy clerks, who worked in a large room, the light to which had been greatly obstructed by the erection of the hoardings put up by the defendants. The plaintiff bought the hotel property in 1882, and at once set to work to have plans got out for the erection of new warehouses. An agreement was then entered into by the defendant, on behalf of himself and his wife, agreed for certain considerations not to interfere with the plaintiff's building up to a certain frontage. The female defendant now challenged the authority of her husband to sign that agreement on her behalf.

Mr. Justice Romer said the agreement in his view did not confer any rights on the plaintiff. What they sold was their right to object to plaintiff's building and nothing else.

Mr. Oswald said it was a remarkable thing that the defendants stood by for nine years and did not make any complaint until they got into the hands of a Mr. Healds, and then the hoarding was put up. He submitted there was no use in giving the plaintiff the right to build if every window he put out could be blocked by the defendants.

Mr. Justice Romer said the point was really not arguable. If the defendants allowed the plaintiff to go on they might find themselves at the end of twenty years restrained from developing their property.

After hearing evidence and the arguments of counsel,

His Lordship, in giving judgment, said that, if he might say so, he was sorry for the plaintiff in the case, because he could not help seeing that he had

been misled by a mistaken view of the meaning and effect of the agreement made to between him and the defendants, and in his judgment the action failed. It also failed on the ground which had been argued before him on the question of ancient lights. The plaintiff's new building was entirely different from the old one, both in size, position, and character, including the position and character of its lights, and had been built apparently with a total absence of any design to make the new windows represent or stand the place of the old lights. Owing to the circumstances, he found himself unable to identify any of the new windows, or any part of the new windows, as preserving or representing or taking the place of the old windows, or any particular part of the old windows. Taking the two hoardings complained of, he was unable to say with certainty that any particular part of them really stopped any rays of light coming over the defendants' building, which would pass through the present windows of the plaintiff, and also through the ancient lights. For those reasons the action failed, but he thought it right to add—although the point was in defendants' favour—that there was in this case an abandonment by the plaintiff of the ancient lights. It appeared to him (the Lordship) that that abandonment was to be gathered in this case from the fact that the new building was entirely different from the old one, including the character and position of the lights, and also from the fact that, although the plaintiff had originally had plans prepared with a view to preserving the old lights, he abandoned them, and took other plans in accordance with which the present building was built, and so showed, as he (his Lordship) had already stated, a total absence of any design to identify the new lights in any way with the old lights. The action would therefore be dismissed, with the usual result as to costs.

ALLEGED OBSTRUCTION OF ANCIENT LIGHTS BY A CHURCH:

ACTION IN THE CHANCERY DIVISION.

THE case of Galton and others v. Keens came before Mr. Justice Romer in the Chancery Division on Saturday and Monday last, it being an action brought by the plaintiffs, Messrs. John Charles Galton, Frank Daniell, and Joseph Edwin Crawford Munroe, for a mandatory injunction calling upon the defendant, the Very Rev. Canon Keens, to pull down so much of his church in Upper Cheyne-row, Chelsea, which had been erected after notice of objection was given in January last, on the ground that the portion erected since obstructed the access of light coming to certain ancient windows in Nos. 10 and 14, Upper Cheyne-row, Chelsea. There was also a claim for damages.

Mr. Eve, Q.C., and Mr. Baker appeared as counsel for the plaintiffs, while Mr. Moreton Smith represented the defendant.

The plaintiff, Mr. Galton, was the freeholder and occupier of No. 10, Upper Cheyne-row, and Mr. Daniell was the lessee for a term of sixteen years unexpired, and Mr. Munroe the under-lessee of the term from Mr. Daniell, and occupier of No. 14, Upper Cheyne-row. The plaintiffs' case was that for a great number of years they stood opposite to their property a house known as Orange House, but it was not of a sufficient height to obstruct the access of light coming to the plaintiffs' premises. Orange House was pulled down in 1894, and towards the end of the year the defendant proceeded to erect a church upon the site, advancing it 20 ft. nearer to plaintiffs' premises. The plaintiffs at first thought that the defendant was erecting a small mission chapel, but after an inspection of the plans it was found that the building would be a height of 45 ft. to the eaves and 53 ft. to the roof. On January 8 notice was given to the defendant that the building obstructed the light coming to the plaintiffs' property, and asking that building operations might cease. The building, however, was proceeded with and had since been completed. As the access of light was very much interfered with—in the case of the basement windows by 30 deg., and 50 deg. of sky area having been taken away—the plaintiffs asked for an order directing the defendant to pull down the building, or so much of it as had been erected since notice was given.

Mr. Munroe, one of the plaintiffs, in cross-examination denied that he had been induced to take these proceedings because he objected to a Roman Catholic church being erected opposite his premises. His sole objection to the building was that it interfered with the access of light to his premises. He had asked owners and occupiers in the row to join him in the action, but Mr. Galton and his own immediate landlord were the only persons who did so.

Mr. John William Willoughby, principal Surveying Assistant to Messrs. Weatherall & Green, and an Associate of the Surveyors' Institute, gave evidence as to making a survey of Nos. 10 and 14, Upper Cheyne-row, and as to preparing a certain plan which was produced.

In cross-examination the witness said that when a building was being erected on the other side of a street, 45 deg. of light was the light which one generally desired to leave, but that would not apply to the present case.

His Lordship said that 45 deg. was generally considered sufficient, but it was not settled.

Cross-examination continued.

In front of the basements there was an iron railing 3 ft. high. He thought that the basements before the building complained of had a very fair amount of light. He never saw Orange House in existence.

This evidence having closed the plaintiffs' case, Mr. Moreton Smith, in opening the defence, suggested that the case had been greatly exaggerated. The plaintiffs were the only persons in the row who objected to the building, and if his Lordship was of opinion that the angle of 45 deg. had been infringed to a material degree it could only be to the two lower windows, and to ask for an injunction to pull down a church because the light to two windows had been infringed to a small extent was an exaggerated claim.

His Lordship said that the difficulty in the learned counsel's way was this: If he came to the conclusion that the lower windows were substantially affected, so that the damage was substantial, then it was a question as to whether the plaintiffs were not entitled to a mandatory injunction, at all events so far as regarded one of the houses—Number 14—as the defendant had chosen to go on building after notice of the plaintiffs' claim. Of course, if a mandatory injunction would be to pull down only so much of the building as interfered with the ancient lights coming to those two windows.

Mr. Moreton Smith said that he should submit that there had been no substantial damage to the plaintiffs' premises. The plaintiffs' case was that they were entitled to the same angle of light as was Orange House existed. The plaintiff had not called any witness who suggested that the letting-value of the houses was at all affected. Supposing the 45 deg. had not been interfered with at all he (the learned counsel) contended that his Lordship would not grant an injunction or give damages.

His Lordship: You must not assume that you are always entitled to build so as to interfere with light up to 45 deg. You know a great deal depends upon the whole of the facts of the case—what light was enjoyed before, and whether the windows are important windows.

Mr. Moreton Smith replied that he was talking of the basement windows. It was not a question of pulling down a little bit of the church, but the plaintiffs claimed a mandatory injunction to pull down the whole of the side of the church.

When the hearing of the case was resumed on Monday, Mr. Eve said that before Mr. Moreton Smith proceeded with his opening he should like to say that Mr. Moreton, who was the gentleman who gave the notice of January 8, had no wish that the church should be pulled down if it could be avoided. Of course, he (the learned counsel) made that remark without prejudice.

His Lordship said that that had occurred to him, and asked if Mr. Galton was in the same frame of mind?

Mr. Eve replied that Mr. Galton was not then present. The learned counsel then suggested that there should be the usual inquiry as to damages.

His Lordship: That is what occurred to me. Mr. Moreton Smith remarked that upon the inquiry as to damages, the point would, of course, be left open as to how much the light had been interfered with.

His Lordship assented. Mr. Moreton Smith: Of course the light the plaintiffs were absolutely entitled to would be a very material point. There would be an inquiry as to damages (if any).

His Lordship said that he would hear the defendant's evidence if necessary. In those matters—although he always listened to expert evidence with considerable interest and respect—the Judge had to make up his mind from the building itself and from the position of matters. His view was that there was an interference with the basement and dining-room windows, and what he should propose would be an inquiry as to the damage (if any) to those ancient lights.

Mr. Moreton Smith said that he had the evidence of other owners of houses in the row that the light had not been damaged by the defendant's building.

His Lordship: They are not experts, are they? Mr. Moreton Smith: They are better than experts I think on this point.

His Lordship: It may be that there is no damage. I daresay, Mr. Smith, that you do not object to there being an inquiry as to what damage (if any) has been sustained to the two lower windows by the erection of the church.

Mr. Eve said that he would rather not be left to the two lower windows.

His Lordship: Well, leave it all open. I think the better course will be to reserve the question of costs. Instead of going to the Chief Clerk, you had, I think, better go to a special or Official Referee.

Mr. Moreton Smith said that he thought they had better go to the Official Referee direct.

His Lordship: Go to a special referee if you can agree on one, and if not, to an Official Referee, if you can agree on one. If you cannot do that, then go to the Official Referee by rotation.

Mr. Eve supposed that the reference would be under Section 13 of the Arbitration Act.

His Lordship said that it might be advisable to reserve the further consideration before him in chambers. He should remember the case if the learned counsel reminded him of it.

Mr. Eve: As your Lordship pleases.

LONDON—For providing and fixing a complete system of low-pressure hot-water apparatus and Trenton boilers, for warming the whole of the school now being built on the site in Finsbury-road, Tooting, for the School Board for London. Mr. T. J. Bailey, Architect. —

J. Clarke & Son	£550
Richardson & Co.	857
Strode & Co.	751
Maguire & Son	774
Duffield & Co.	572

Recommended for acceptance by the Works Committee.

LOWESTOFT—Acquired for new house. Mr. T. E. Key, architect, 6, Bloomsbury-square, W.C. —

A Cox	£1,530
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MAIDENHEAD—For the supply of sandstone, kerb, and pitching; also laying same, for the Urban Sanitary Authority. Mr. Thomas Nash, Borough Surveyor, Maidenhead. —

Free & Sons, Maidenhead and Bristol. — At schedule of prices.

NEWPORT (Mon.)—For the construction of an iron foorthridge, Rodney Parade (Contract No. 3), for the Harbour Commissioners, Messrs. T. Dyer Steel, C.E., & Coyners, Kirby, & Son, C.E., Skinner street, Newport. —

Mooley, Carney, & Co. Ltd.	£251 0	Rubery & Co.	120 0
Albin & Co.	213 0	T. Woodall	147 15 8
E. Finch & Co.	109 0	"Mileys" Vale, Iron	10 0
E. C. & J. Kerry, Ltd.	132 0	W. & L. Co., Bristol ..	147 15 8
Smervell & Co.	127 0	J. S. Ellis	128 10 0
Worsington Bros.	175 0		

* Recommended for acceptance.

NORTH SHIELDS—For the construction of roadways and footpaths, Rossett, for the Tynemouth Rural District Council. Mr. John Waters, C.E., Long Benton, near Newcastle-on-Tyne. Quantities by Engineer. —

Geo. T. Manners	£439 10	James McLaren	£249 13 6
John Adams	275 1 6	Geo. E. Simpson, J.R.E.	345 0
John Thompson	261 17 3	son-terrace, New	238 5 0
John I. & J. Robson	284 10 0	castle	238 5 0
J. William Robson	273 6 0		

* Accepted.

PETERBOROUGH—For the erection of a dwelling-house, Green-lane. Mr. J. G. Stallebrass, architect, North-street, Peterborough. —

Watson & Lucas	£215 0	Nichols	182 0
Walker	193 0	Nichols	170 0
Cuttridge	100 0	Cracknell	174 0
Clare & Spriggs	186 10	Pape (accepted)	172 0

PETERBOROUGH—For additions, &c., to school buildings, Doghouse, Mr. J. G. Stallebrass, architect, North-street, Peterborough. —

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Tellings	420 14	Aspitell & Neave	345 0
Pine & Lettall	420 0	Pape	336 0
Watson & Lucas	470 0	Nichols	381 0
Cracknell	398 0	Cuttridge, Peterborough ..	320 0
Sibley	370 0		

* Accepted.

PETERBOROUGH—For the erection of civil fences, gates, dwarf walls, &c., next Broadway, Peterborough, for the Cemetery Commissioners. Mr. Jas. Ruddle, architect, Boroughbury, Peterborough. Quantities by architect. —

Thompson	£721	Cuttridge	£671
Wendrick	715	Smith	670
Nichols	683	Amies, Long Causeway ..	641

[All of Peterborough.]
* Accepted.

SUTTON COLDFIELD (Warwickshire)—For the erection of a house and school, &c., Mr. J. A. Jones, architect, Sutton Coldfield. Quantities by Mr. Anthony Rawse, Newhall-street, Birmingham. —

	House.	Stabling, &c.	Fencing gates, &c.
J. Harley & Son	£365	£208	£277 0
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W. Supton & Sons	309	539	86
W. & J. Webb	500	510	85
J. Barnsley & Sons	268	495	90
Mark Lloyd	208	495	82

* Accepted.

UCKFIELD (Sussex)—For the execution of earthworks, Alexandra-road, and three others, for the Urban District Council. —

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S. Hulston	123 0	Be-chlor	185 0
Tyhurst & Son	105 12 0	E. Gussall	185 0
		S. Stevens, Uckfield ..	19 10 0

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WARGRAVE (Berks.)—For the Wargrave and Twyford Water-works. Mr. A. Marshall, C.E., Swindon. —

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James Holmes	5,001 10 0	Enfield, Middle	4,176 6 5
G. H. Gibson	5,095 8 0	sex (accepted)	4,176 6 5
R. E. Pacey	5,111 13 3		
Ward & Cannon	4,750 16 5		

WEST MALLING—For alterations and improvements to Boys' and Girls' schools, for the School Committee. Mr. Walter Goodwin, architect. —

T. Webb, East Peckham, (accepted as amended).....£511

Sanitary Works at Stoney Union—In our issue of November 30, page 48, the name of Wales & Co. occurs. Mr. G. Wales, of Kenyon-road, South Hackney, writes to say that the name of the firm is George Wales, and that no other person is connected with him. The mistake was not ours.

TO CORRESPONDENTS.

M. W. (below our limit).
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The Builder.

VOL. LXIX. No. 755

DECEMBER 31, 1895.

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Building Contracts.



E cannot but express a wish that any writer who is full of knowledge of a special subject, and eager to give the public the benefit of it, would endeavour

to do so in the most concise form which is compatible with clearness of exposition. It is to be desired, even on the lowest ground, that of expense, for we have before us this useful work, the price of which is 2*l.* 10*s.*, a sum which places it out of the reach of many—at any rate of the younger of our readers, who would probably be those to whom it would be most valuable. We have no hesitation in saying that the book before us* might have been smaller in size, and have been not one iota less useful. It is in form written in sections—a system of much value where these sections contain statements of fixed and decided rules of law and practice. If, however, these sections contain perfectly well recognised facts, not of law, but of common knowledge, then the system is to a large extent useless, and at the same time, expresses the need of greater compression. We will give an example. At page sixteen, we find a sub-section headed "Sub-contractors," which contains the following words. "It is a common and growing practice in building work for persons who take contracts for large works to sub-let part of the work, with a view either to obtain the benefit of the special skill of the sub-contractor, or to limit the risks and liabilities of the principal contractor." More to the same effect follows, but we have quoted enough to make any reader ask why is he to go into the motives which underlie the common practice of sub-contracting. All that those who take up this book desire to be told is, what are the rights and duties of contractors and sub-contractors towards each other and the principal employer. We make this criticism because we thoroughly appreciate the amount of labour given by the author to his

task, and desire to see so laborious a work presented to the profession in the best possible form.

But we have another point of great importance to notice: it is that Mr. Hudson, in his praiseworthy desire to give as much information as possible to his readers, seems at times to state as legal principles what are not such, and therefore misleads those who may refer to his book. Thus, at page 52 we read, under the mysterious head of "Private Law," that "The architect is bound to ascertain whether any rights exist, whether of way, water, light, air, or other easements, or whether there is any reservation of minerals to which regard must be had in the planning and construction of the building, since the building owner is liable to adjoining owners for any infringement of their rights." If a person is "bound," that means that he is under some legal obligation to do a certain thing. Now we unhesitatingly say that the statement quoted is quite inaccurate. It is not for an architect to ascertain what may be the relative rights of adjoining owners, and if he does not so ascertain and damage ensues by a breach of such rights he is not in any sense liable. It is the duty of the owner of the property, when he instructs the architect, to inform him what are the particular rights in regard to his own and adjoining premises. Mr. Hudson goes so far as to say that to prevent interference with the rights of adjoining owners, the architect "ought to ask to see the conveyance or contract of purchase or building agreement relating to the land upon which the building is to stand, and also to inquire as to any easements," and so forth. According to this statement the architect should in fact perform the functions of a lawyer. This is altogether misleading; an architect may, as a friendly act, ask if there are any easements or rights which may have to be considered; but, *primâ facie*, his duty is to plan and superintend the erection or alteration of buildings, and it is for the owner to inform him what rights of others have to be respected. Again, under the head of "Recommending Builders," Mr. Hudson states, "The architect does not guarantee the solvency or capacity of the builder," a truism which does not require to be stated, "but it is his duty to his employer not to let him enter into a contract with a

man whom he has any reason to suspect of being unable, from financial reasons or lack of skill or otherwise, to carry out the work with all due speed and in a satisfactory manner." It is a friendly act on the part of one man not to let his neighbour employ an insolvent tradesman, but it is a thing which should never be undertaken without the most absolute proof of insolvency. If an architect has reason to suspect the solvency or capacity of a builder, he may well inform the employer of some fact from which the employer may draw his own conclusions. But *primâ facie*, an architect, unless he has express authority to select a builder, owes no duty to his employer to protect him against an insolvent builder. Nothing is more undesirable than to throw on professional men burdens not strictly within the sphere of their duties, and it appears to us that Mr. Hudson endeavours to place on the shoulders of architects burdens which the law does not impose on them, and which no reasonable man can desire that it should.

It need hardly be said that this work does not contain a very large proportion of new material, nor does it throw much fresh light on the law of the subject. Perhaps the most important legal development is that which has finally settled the question of the architect's liability to the employer and the builder in regard to a final certificate. So far as regards the latter: the architect's certificate is final, even if it has been negligently drawn up. But it is not final under such circumstances against the employer, who can recover damages in respect of such negligently-made certificate. It was the case of *Rogers v. James*, decided in 1891, which settled the law in this respect. That is to say, as between the employer and the contractor, the architect acts in a judicial capacity, and unless the contract makes some reservation in regard to the certificate, when he has given a decision, negligently or not, it is final. But, as between the employer and the architect, the latter is liable for negligence. He is in exactly the same position, as regards the giving of the certificate, as any other kind of agent who is employed to do some act which he must take care to do without negligence. It may be doubted whether the law was ever contrary to this; but it may fairly be admitted that in this country there had never been any strict judicial enunciation of it before this

* "The Law of Building, Engineering, and Ship-building Contracts, with Precedents and Reports of Cases." By Alfred A. Hudson, Barrister. Second Edition. In two Vols. London: Waterlow & Sons, and Stevens & Hughes. 1895.

judgment in the above-mentioned case. Therefore it may, with perfect justice, be said that the point has only recently been settled. It is well that an authoritative judgment should exist, since there can now be no doubt upon the question. It is one of the misfortunes of our legal system, composed as it is so largely of judicial decisions, that unless there is a judicial dictum on a point it may always be regarded as open to argument.

Apart from any question of pure law, perhaps the most noticeable features in connexion with the recent decisions are the impotent efforts of contractors to get rid of burdensome conditions in contracts. Sometimes they have fallen into very hard places, but in every instance they are tied and bound by their own agreement. For example, in the case of *Jackson v. the Eastbourne Local Board*, one clause of the contract made by the plaintiff and the defendant ran as follows: "The said contractor shall take upon himself and be answerable for all accidents and damages from or by seas, winds, drift of craft, fire, or any cause whatsoever, which may occur during the construction of the works under this contract, and in case of such accidents or damages arising, shall repair and make good the same as soon as possible at his own cost and charges." The works were injured by the sea, and an attempt was made to show that the Local Board should have kept the shore at the same level as shown on the plans, in which case the damage would not have been done. The litigation did not cease until the House of Lords was reached, where, as in the Court of Appeal, the contractor was defeated. At the beginning of his judgment the late Lord Selborne said "it is impossible not to feel sympathy with the appellant in this case, who probably has sustained a very great pecuniary loss by the misfortune which has happened to him in the execution of his contract, but in deciding the law we cannot be influenced by any feeling of that kind." It might have been possible for the contractor to have guarded himself against such a misfortune by the contract, or not to have entered into it at all. As it was he could only fight uselessly against the bonds which he had forged for himself. Not a little of the litigation arising out of building and similar contracts is in regard to these very stringent conditions, which often throw on the contractor losses which should more fairly be borne by both parties. But none of the recent decisions on the subject of the terms of building contracts, or indeed in most of the subjects of building law, contain new principles. They are mostly the application of old principles to new facts. Nothing is more interesting than to observe how this is done, but we are not altogether in sympathy with authors who elaborate these illustrations. To do so has a tendency to divert the attention of the reader from clear and broad principles, and it is only by having these firmly fixed in the mind that a sound judgment and opinion can be formed upon the often complex facts, out of which disputes and difficulties in building and similar contracts arise. If we attempt to come to a conclusion on one set of facts by drawing on our recollection of others, it is not improbable that a wrong judgment will be formed; if, on the contrary, we bear in mind some cardinal and governing principle, and test the facts in relation to that, the opinion formed is more likely to be sound.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND

By PROFESSOR BALDWIN BROWN.

VII.—Timber Construction, and its Traces in Stonework.

IT is not the intention of this paper to discuss the question, so often raised, about the relative numbers of wooden and stone churches in the Saxon period. As is well known, out of

more than 1,700 churches mentioned in Domesday, only one is described in that Survey as being of wood, but it may just as well be argued from this that wooden churches were rare as that they were common. Saxon records, from Bede downwards, contain abundant references to timber-built churches, but the notices of stone structures are numerous enough to make it an open question whether, when no material is mentioned, we should assume it to have been the one material more than the other. We are not, however, concerned so much with wooden churches in themselves, as with their possible influence on the form and technique of churches in stone, and in this connexion it is important to note how numerous are the cases in which we read of an earlier wooden structure being later on rebuilt in stone, for in such instances it would seem a reasonable hypothesis that traces of the earlier technique would survive in the later. Thus, at York, the first church hastily erected by Edwin of Northumbria for his baptism was of wood, but he soon went on to build one of stone, and according to a passage quoted by Leland ("Collectanea," iv., p. 43) he did the same thing at Tynemouth. At Lastingham, Cedd builds a wooden church, but before Bede wrote his history (about 730 A.D.) it had been replaced by one of stone. In the tenth century the same thing was done at Wilton, and not long before the Conquest Ethelric, Bishop of Durham, repeated the process in the case of the church at Chester-le-Street.

In order to estimate what likelihood there is of the stone forms of Saxon churches being thus derived from wood, we must first ask in what style of wood construction the early timber structures were erected. Now it is not probable that the often-quoted expression, *mos Scottorum*, implied any special kind of construction in wood peculiar to the Celtic tribes, or that the Teutonic settlers brought with them any particular technique different from those practised by timber constructors all over the world. There are essentially three types of wooden buildings—the wattle hut, the block house, and the structure of framed timber work. The two former are primitive, and every country and every age must have produced abundant examples of them. The latter is scientific and proportionately uncommon. It is the contention of this paper that early Celtic and Saxon structures of wood were of the two former types, while framed work is a matter of classical tradition, and was probably rare, if not unknown, in the pre-Conquest period of our national architecture. The question, whether or not this contention is justified, is one which has considerable significance for the subject before us, for there are certain features of Saxon masonry for which an origin in framed timber-work has been suggested, and if no such timber-work can have existed the suggestion will naturally fall to the ground.

It is impossible to disprove the knowledge of the technique of framed timber-work on the part of the Saxons, for the art of shipbuilding, which they must have known in their Continental homes, cannot be carried far without introducing the ribs and planking which might readily develop into the frame-and-filling of the half-timbered house. M. Ruprich-Robert, in his "Architecture Normande," has a suggestion (which he does not follow out) about the influence of the tradition of shipbuilding among the northern sea-rovers on the timber work of the roofs in Norman architecture. Existing evidence tends, however, to show that when the Saxons wanted anything more solid than the wattle-work, which is in most regions the most primitive form of wooden building, they adopted the block-house system familiar in Switzerland and Canada. The various passages about wooden churches in Bede and later Saxon writers merely prove that they were solidly built with posts and timbers, so that they could be taken to pieces and the material used over again, but the character of the one surviving Saxon

church of wood at Greenstead, in Essex, as well as that of timber structures represented on the Bayeux tapestry, enables us to conjecture that it would be the block system that would be generally employed.

Space does not permit of a detailed description of Greenstead Chapel (fig. 42), but it would be worth publication even in its

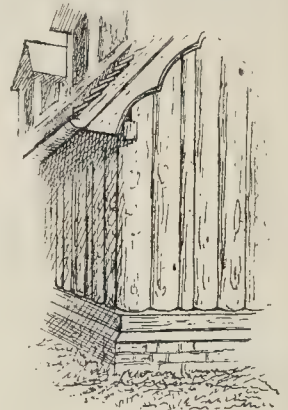


Fig. 42.—North-west Corner of Greenstead Church, Essex.

present restored condition. The walls of the nave, which from literary evidence may be dated about 1013, are formed of upright balks of timber made of trunks of oak-trees split down the middle, stripped of their bark, and smoothed with the adze on the flat faces. They were placed closely side by side with the flat faces inwards and the half-rounds showing on the exterior. Originally the trunks were let into a sill of oak at the bottom, and fastened at the top with wooden pins to a horizontal plate. The sill and the plate are, however, mere adjuncts rendered necessary for fixing purposes, and essentially posterior, and not prior, to the uprights that represent the main structure. In framed work, on the contrary, the skeleton is essentially prior to the filling, which is of lighter construction. There is no sign at Greenstead of any such organic relation between the corner-pieces, the sills, and the horizontal plates as would lead us to recognise in them the essential elements of the structure. This point is worth bringing into prominence, as Professor Dietrichson, in his recent book on the timber architecture of Norway, claims Greenstead as an example, though an undeveloped one, of framed work, and brings it into a certain connexion with the wooden churches of his own country. Now these Norwegian structures, highly interesting though they are, are not exactly of a primitive character. They are basilican in plan, were very often apsidal, and in such features as round-arched arcading, or cubical capitals, exhibit a direct imitation of Romanesque stone forms in wood, while no earlier date than the eleventh century is claimed for any existing example. The construction, as the writer just named has shown, is scientific, and depends essentially on the principle of "frame-and-filling." Greenstead, on the other hand, is a work of palisading, resembling in construction the timber fortifications on the tops of the mounds or *motes* shown in the Bayeux tapestry. It is primitive in form and character, and shows no trace of influence from classical sources. It may, of course, be argued, in spite of this, that what we call half-timber work in the houses of the later Mediæval epoch was already known in Saxon days, but it is sufficient for our purpose to repeat that, in the absence of direct proof of this, it is safer to assume that Saxon timber construction was confined to some forms of wattle and block-work, so that it would be only from these sources that wood forms can have been transferred to stone.

What, now, are the principal features in Saxon stone buildings, for which a wooden origin has been claimed? Such an origin has been suggested, *inter alia* (1) for "long-and-short" quoining (Parker, in "Rickman," 6th edition, p. 63), and (2) for pilaster strips and cross-pieces between them, as well as the triangular pediments that sometimes join them above, as at Barton-on-Humber (fig. 43a), and Earl's Barton (fig. 43b.) (Parker,

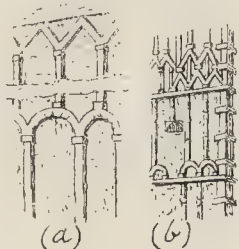


Fig. 43.—(a) Barton-on-Humber; (b) Earl's Barton.

"Introduction," 9th edition, p. 27; Romilly Allen, "Monumental History," p. 190). In connexion with (1) the point may again be emphasised that the use of "long-and-short" in the framing of openings, is prior to its employment in quoining. In openings we find it both in primitive Irish and in Byzantine work, but neither there nor anywhere else, so far as the writer knows, does it appear in corners, save in Saxon stonework. At Monkwearmouth and Escomb we have it in doors but not in quoins, though there are indications at Escomb of the latter use. Now, in doorways, where both the "long" pieces and the "short" are not beams or pillars, but flat slabs, there can be no suggestion of a wooden origin, for the flat slab is a stone, not a timber form. If, therefore, this peculiar alternation of stones in the quoins is derived from the similar bond used in doorways, then there can be no question of any copying of woodwork.

In the case of (2) the pilaster strips and their finish, Sir J. H. Parker ("Introduction," l.c.) regards them (at Earl's Barton) as "intended to bind together the rude masonry of the walls," "in the manner of a framework of timber"; while Mr. Romilly Allen ("Monumental History," l.c.) sees rather an artistic intention of relieving the monotony of flat surfaces. Probably both views are correct, and the constructive and æsthetic advantages of the feature were both of account. As constructive, it resembles a curious bond in stone-work, of a fashion shown in fig. 44, which occurs at Pompeii,

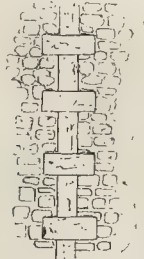


Fig. 44.—Wall at Tours.

in Roman work, in Mediæval buildings in the valley of the Loire, and in modern times over all the country round Caen. The Saxon pilaster does not only, however, act as a bond; it projects from the surface of the wall, and shows in front of the plastering, where it produces an effect similar to the hollow, square, pilaster-like strips common in German Romanesque churches, and called *Lisenen*. It is in truth nothing

more nor less than a tentative effort on the part of our native builders to imitate the vertical strips dear to the Romanesque builders on the Continent. The latter are joined above under the cornice by a succession of small round arches, while in Saxon work the connecting wall-arches are commonly bigger, and may take the straight-sided form which occurs commonly enough in door and window openings. The "stone carpentry," as Sir J. H. Parker calls it, at Earl's Barton, though it may bear a superficial resemblance to the timbers of framed-work, is simply a somewhat irregular and clumsy form of Romanesque wall-arcading. When the pilasters are less numerous, and are not connected by the fantastic cross-pieces that occur at Earl's Barton (as for, example, at Stanton Lacy in Shropshire, Repton, or Corhampton) no one would think of framed timber-work. The resemblance to the German *Lisenen* is quite unmistakable, and the prevalence of wall-arcading in Continental Romanesque is quite sufficient to give us a key to the origin of the feature. When we add that, as we have seen, we have no warrant for assuming that the Saxons had framed-work from which to copy, the idea of a timber-origin loses all validity.

It may be safely stated that the idea of a wooden origin for the forms of Saxon stonework is rather a superstition than a conclusion strictly reasoned out. It is assumed that a people accustomed to construct in wood must carry their traditional timber-methods into their masonry, but this is by no means necessary. It is true that much of the stone architecture of Egypt and of Greece and Italy shows very distinct traces of an origin in wood construction. On the other hand, the Pæonians were a people who built equally well in wood and in stone, yet do not seem to have carried timber-methods into masonry. They built Solomon a palace of wood at the same time that they constructed for him a temple of stone, but the latter was essentially a stone building, without, as far as we can judge, any timber features connected with it. In like manner the ancient Irish, though they may have possessed a *mos Scottorum* of wooden building, do not seem to have been influenced by it when working in stone. Those early specimens of Irish masonry, the great dry-stone forts of Kerry and Aran, are as essentially stone fabrics as the terrace walls of the Haram platform at Jerusalem—there is no trace in them of the influence of an earlier or a contemporary timber tradition. Irish stone architecture progresses from these dry-stone forts to the later round towers and churches of the twelfth century, without any admixture of wooden features derived from a native source, and the same thing may be said of the stone structures of the Saxons. Stone churches in pre-Conquest England took the place of wood without adopting timber features. The two traditional materials were used independently as they were used in Ireland, and the influence of native practice in the construction of ships or of houses of wood practically counts for nothing as an explanation of pre-Conquest masonry.

NEWGATE PRISON.

NEWGATE, like the Newport at Lincoln, marks the site of an entrance into a Roman city. The gate was made in the west side of the later city wall, of *circa* 365 A.D., for the ancient road, perhaps a British road, which from this point traversed London in a south-easterly direction, towards the crossing over the Thames, a little distance westward from London Bridge. It were beyond our purpose to discuss here the origin of its name. Suffice it to say that, *temp.* William I, a gate, known as *Stamford*, or the Chamberlain's Gate,* stood

* William le Chamberlain held in this neighbourhood thirteen acres, "No Man's Land," cited in Domesday.

across the street at a spot between Warwick-lane and the present prison. That gate, rebuilt in the reign of Henry II. or his successor, was, in the reign of Henry III., in common use as a prison. In the year 1400, Henry IV. committed it by charter to the care of the Corporation. Sir Richard Whittington, moved by the ruinous state of the fabric, combined with the terrible condition of the gaol, instructed his executors to rebuild the gate. That was done upon the customary plan. The central portion had an archway and a north postern; the four flanking octagonal towers had battlements. The two fronts had ranges of Tuscan pilasters with entablatures; one of the seven statues represented Liberty with a cat at her feet.* To this gate an addition was subsequently made, southwards, fronting Old Bailey, the added portion containing an entrance and a gaoler's lodge, above the latter being a sun-dial with the inscription, *Veni sic fur*. Of Whittington's prison there is an early view in a black-letter pamphlet, "The Discovery of a London Monster called the Black Dog of Newgate. . . . imprinted at London . . . 1612," and in the Crace collection is an illustration (1650) from the rare "Herba Parietis," showing the wallflower growing by two of the windows. The east portion of Whittington's prison was repaired in 1630-1, and again in 1672, having suffered from the Great Fire—as we read in an inscription preserved by Hatton; the repairs of 1672 are said to have been executed by Wren. In 1638 the entire building was re-entrained; the author of the "History of the Press Yard" (1717), who was there amongst the Jacobites of 1715-6, says:—

"This tomb of the living [the Press Yard] was once 'The Prison' Inn, by Newgate-street, and being contiguous to the gaol . . . was added to it in times of the Usurpation."

The Press Yard, or exercising ground, lay east of the Stone Hold, and the Lower Ward, in the Common Felons' Side on the ground-floor.

George Dance the elder made designs for a rebuilding of Newgate and Giltspur-street Compter, to be connected by a fresh gate across the street. His plans are illustrated in the *Universal Magazine* for April, 1764, and are also separately printed, on three sheets. In February, 1767, he was succeeded as City Surveyor by his son, George Dance, R.A., whom the Corporation employed upon the new works, they having obtained an Act in 1766 (followed by one in 1777) for raising subsidies in that behalf. The operations proved very costly. Excavation for brick vaulting was carried down to a depth of 40 ft. The first stone was laid on May 31, 1770, by Lord Mayor Beckford; in 1777 the last remaining portion of the old prison was pulled down. The new buildings were unfinished when pillaged and burnt, on June 6 and 7, 1780, by the "No Popery" rioters, who released all the prisoners, including their own comrades; and a further sum of 30,000*l.* was devoted to repairing and completing the fabric.

Dance's plans consist of a central block (formerly the Governor's residence) between two lodges in recesses, and two wings. The outer walls are nearly 4 ft. thick, and at the wings stand quite free from the buildings within. The top story of the Governor's house has replaced the angle-pediment of Dance's elevation as illustrated in Ferguson's "History of Architecture," Vol. iii. (edit. 1862), and Dance's designs did not include the east portion of the outer north wall, with the adjoining Ordinary's house in Newgate-street. The south or turnkeys' lodge, forms the usual entrance: the north lodge (which now contains the kitchen) is known as the "Debtors' Door," and there in the wall still remain the staples by which the scaffold was fastened. The "Iron Door" was made latterly, for admittance of the prison-van into the yard in which stands the block of cells, on the Felons', formerly the Debtors',

* Four of the statue may be seen in the south wing of the prison.

Side, which rises above the outer wall.* On the north side of that block is part of the old Press Yard, its stones cut with two boundary marks of Christ Church and St. Sepulchre parishes. Behind the house is the chapel, standing on a vaulted arcade, and overlooking the Middle Yard, which lies between the South, or Women's, Yard, and the North, or Chapel, Yard, in which are the Visitors' Cage and a shed for the gallows. East of these is a block—in brick with stone dressings—of old wards, no longer used, three stories high. A passage leading along the east side of the Women's Side (south wing) to the Criminal Court is bounded by a length of the old City wall, wherein are cut the initials of some of the felons who are buried beneath the flagstones of the passage. The stones of the north wall of the Ward block bear traces of fire—a memorial of the rioters. The cells in the north wing were built in 1857-9, those in the south wing (Women's Side) three years later. Since 1882 Newgate has been used only for prisoners awaiting trial during Sessions, and for prisoners condemned to death. We may add that the design of George Dance the younger for Giltspur-street Compter (1787-91), was very similar to that for Newgate: the Compter was pulled down in 1855; its site has since been used as an open-air gymnasium for Christ Hospital.


Among the illustrations in the present issue will be found an elevation of the prison, together with a detail of part of the work to a larger scale, and sections of the cornice and other mouldings, from measured drawings made by Mr. G. J. J. Lacy. In the process of measuring the building Mr. Lacy noted one or two points which may be mentioned. The walls of the north and south bays are practically only screens; the wall at the north end acts as a protection to the brick front of the "New Prison" (the only portion now used for prisoners). The portion shown on the drawing, and standing above the north bay is faced with stone and continued down from the blocking course, till it is on a level with the blocking course of the solid screen front; below this level the rest of the New Prison is of brick. The upper portion, seen from the street, is thus in keeping with the whole, which could not have been the case if the brickwork of the New Prison had been carried up its full height.

The iron doors shown and noted on the drawing are very carefully modelled to imitate the stone-work, and the distinction between them and the stone is hardly noticeable except on a careful inspection. The filling-in of the vousoirs in most of the arches is peculiar in shape and quite worth study.

The gloomy appearance of the building is really, in a sense, an evidence of the thought and talent of the architect. He was commissioned to build a prison, and he modified the ordinary materials of Renaissance architecture in such a manner as to give them quite a new expression, and to intensify the fortress-like aspect proper to a prison. Newgate is in its way one of the most characteristic and powerful pieces of old London architecture, and in this sense it is to be regretted that in all probability we shall lose it before very long.

During the demolitions for making Holborn Viaduct, thirty-five years ago, the view of the prison, standing on the high ground, as seen from the valley below, was very fine.

NOTES.

 HE paper by Dr. Richter at the Institute on Monday night is a very valuable and interesting one, as those members who were not present will realise when they get the full text with the illustrations in the Institute Journal. One of the special points of interest treated of was the origin of the Ionic capital, and Dr. Richter brought for-

ward anew the theory which has already been strongly pressed, and backed up by a host of illustrations, by an American author, Professor Goodyear. Dr. Richter's fewer and better selected illustrations made a stronger case for the lotus origin of the Ionic volute than was made by Professor Goodyear, who weakened his argument by not selecting his illustrations sufficiently; consequently Dr. Richter was more convincing, comparatively speaking, than Professor Goodyear; nevertheless we remain unconvinced. Mr. Alma-Tadema was perfectly right in calling attention to the important and radical difference between a volute which springs upwards from the necking, and one which springs downwards from the upper horizontal member of the capital. And the spiral of the Greek Ionic volute is distinctly geometrical in its character, and, as the President observed, has an obvious connexion with the spiral forms of ornament found at Mycenæ and Tiryns. Those, however, who wish to be in the latest archaeological fashion will for some time to come have to think of the Ionic volute as a development from the Egyptian lotus. Archaeological creeds are much more influenced by fashion than is commonly realised; and the lotus origin of the Ionic volute is the latest fashion.

THE speeches of the Duke of Devonshire and of Mr. Chamberlain at Birmingham have again directed public attention to the question of technical education. One thing, however, appears to become more and more clear, that the time has arrived for a more systematic teaching under State control. The spasmodic and in some instances amateurish attempts at technical education by local bodies with the grants at their disposal, can do little really and permanently to create a system of technical education which will benefit the nation. In this respect, our insularity is great: the bulk of the population of the country have no idea as to the state of technical instruction on the Continent, or to what extent it strengthens foreign competition with Great Britain. Such demonstrations as those at Birmingham are most important in a popularly governed country such as ours, where no great and substantial movement of any kind is possible without some popular force which has to be created.

A VERY important industrial exhibition is to be held in London next year, at the People's Palace, under the title of "The East London Trades, Industries, and Arts Exhibition." It will be divided into six main sections, as follows:—(1) Exhibits of Manufacturing and Trading Firms; (2) Work of Individual Craftsmen; (3) Exhibits by Individual Students and Apprentices; (4) Exhibits by Students collectively and by Institutions; (5) Women's Work; (6) Loan Exhibits of Works of Art. Section 3 is confined to persons under twenty-one years of age, and a certificate will be required from a teacher or a foreman to the effect that the work is the genuine production of the exhibitor. We regard these two sections of individual work, 2 and 3, and Section 2 especially, as the most important portion of the proposed exhibition. The formation of a special section for women's work is generally a popular feature in such an exhibition, and in regard to those branches of industry which are pursued only by women no doubt there is a good reason for it, but it ought to be confined to those. In the schedule no class of work is specified, as it is in regard to the other sections. Giving a special position to women in work which is also done by men has always proved to be a mistake; as is very conclusively shown in the case of art exhibitions of women's work only, which have always resulted in the collection of a number of works the majority of which would have had no chance of admission to a general exhibition. It is much better, in all trades or arts in which both men and women can work, that they should compete on equal terms and without any sex distinction. But

of the general interest attaching to such an exhibition as is proposed there can be no question, and we hope it will prove a great success. The exhibition is to be opened in June. The Prince of Wales is Honorary President.

FROM a prospectus which is being widely circulated, we gather that a company is being "promoted" to build the new opera-house at the Haymarket, with certain adjuncts, whilst a second company is to be formed to act as lessees. Besides the theatre proper, there are to be numerous shops, an arcade and restaurant, a club, and some chambers on the site, though we can scarcely understand how the plan appended to the prospectus can ever be accepted by the London County Council unless the present theatre regulations are specially relaxed to meet the case, and a gross injustice done to those who of late years have gone to no inconsiderable expense to comply with the official code. The County Council no doubt has powers to relax certain of its regulations, but a most injudicious and dangerous precedent would be given, if, for instance, rule No. 6 were modified. This rule prohibits shops in the theatre block proper, and yet this plan shows an extraordinary intermingling of shops, theatre staircases and exits, &c. No matter what "fire-resisting" materials may be used to separate the shops and offices from the theatre proper, the danger of panic through an outbreak of fire in these adjuncts remains, and likewise the danger of smoke. The existence of the shops also spoils opportunities for clear exits, and compels the complicated and more dangerous planning of the staircases. In this "modern scheme" we actually find staircases which have no direct air and ventilation, whilst the bends and turns are anything but reassuring. A theatre carried out at the present day as proposed in this plan would be an absolute anachronism.

IN regard to the question of the relation of the architectural and engineering professions, and the view which has sometimes been expressed recently, in this country, that they should never have been separated, it is of interest to note that in the Berlin "Architekten-Verein," which has hitherto consisted of two sections, one for architects and one for engineers and surveyors, it has just been determined that this distinction is unnecessary and inconvenient, and the division has been cancelled. There will, however, be two specialist committees of seven members each, to attend to any special interests in connexion with what the Berlin Society has evidently determined to regard as two branches of the same profession. What would the "Memorialists" say to this?

THE new "Hofburg" at Vienna—or rather the new wing of the old Hofburg, which is part of the extensive group of Imperial buildings jointly designed by the late Gottfried Semper and Baron Hasenauer—has now been roofed in. The scaffold is to be struck on the occasion of the Emperor's jubilee, and the interior has to be ready by 1900. The works are at present being carried out under the supervision of Messrs. Hofer & Gruber, who are Baron Hasenauer's successors, and Herr Bartelmus is acting as clerk of works, which, in this case, means being chief of a large technical department. The building will be one of the most massive structures in Europe, the size of the blocks of freestone being quite unusual, frequently as much as seven cubic metres. Stone from the Mazzanera quarries has been used for the principal entablature. The building is so situated as to have its main frontage on a large quadrangle, and its rear elevation looking on to the Emperor's private grounds. The apartments of the Emperor and Empress face these grounds, and are situated on the first-floor. The large reception-rooms are on the same level, but face the quadrangle. The

* On the opening of Whitecross-street Prison in 1815, Newgate ceased to be used for debtors.

superficial area which the new Hofburg takes up is 14,300 square metres, or more than the new Town Hall at Vienna.

THE Fine Arts department in Paris is proposing the erection of a monument to Delacroix at Saint-Maurice, his native place. The decoration of the new Mairies of Alfortville, Perreux, Issy-les-Moulineaux, and Suresnes is also under consideration. The last-named scheme will probably be the subject of an important competition among painters during the coming year.

THE Edinburgh Corporation are to be congratulated on the phenomenal success of their electrical supply works. Although they only began working some eight months ago, yet already the electric lighting committee have recommended that the existing plant be practically doubled. It is probable that, after paying all working expenses and allowing for interest and depreciation, there will be a profit of about 3,000*l.* on the first year's working. Professor Kennedy, in a recently-issued report on the working of the scheme, has made some remarks which are of more than local interest, as they concern the vexed 200-volt supply question. He says that, two years ago, when he was asked to design a scheme of electric supply, there were no satisfactory 200-volt lamps to be had, but he chose a system in which full advantage of these lamps could be taken, if ever they came on the market. He considers that satisfactory 200-volt lamps can now be obtained, and he hopes that the Corporation will soon be supplying current at twice their present voltage, *i.e.*, 230 volts. As to the difficulty of changing the lamps, he makes the following suggestions. The undertakers should give notice that on and after a certain date, say February 1, 1896, their standard pressure will be 230 volts in respect to all new customers, and that on and after another certain date, say August 1, 1897, the new voltage will be the standard all over the system. Also, that at any time between these dates any consumer will be supplied with high-pressure lamps at 6*d.* each, in exchange for his old lamps, the effect being that the consumers would run their old lamps as long as possible, and then exchange them for new ones. He calculates that the total cost of this to the undertaking would be 670*l.*, in addition to the wages of the men changing the lamps. The great advantage of this change to the undertakers is obvious, practically quadrupling the capacity of some of their most expensive feeder-mains. In order to gild the pill he recommends that a substantial reduction, either in the nominal price of the unit or the scale of discounts, should take place from the New Year.

WHILST admiring the ingenuity of the above-mentioned scheme for introducing high-pressure lamps, if we were consumers we would prefer our 115-volt lamps, and think that a reduction in our meter bill was dearly purchased at the cost of introducing a double pressure into our house wired for the lower voltage. Besides, the high-pressure lamps cost 1*s.* 6*d.* as against 1*s.* for the lower pressure. It is too early yet to state definitely the relative merits of the lamps, but there are several obvious drawbacks to the use of the high-pressure ones. In the first place, the filament is longer, and therefore the blackening of the lamp by the deposit of carbon must take place at a greater rate, and therefore the candle-power must deteriorate much more rapidly. There is double the chance of a weak spot in the filament, and hence the average life will be shorter. At first sight it would seem as if there would be danger of the filaments of the lamps short-circuiting and burning the lamp out if it were shaken, but practically all the lamps we tried survived this test, although we made the filaments spark across, and no doubt

weakened them. However, we have given sufficient reasons to show that the high-pressure lamps must be inferior. For this reason, as well as for the more serious drawbacks we mentioned last week, which are endorsed by a letter from Major Flood Page in Tuesday's *Times*, we would strongly advise consumers not to be talked over into accepting a higher pressure of supply.

THE Report made by Dr. S. W. Wheaton to the Local Government Board, on the causes of an outbreak of enteric fever in the Quarry Bank Urban District, brings up again the old evil of polluted wells. The Report describes the condition of the houses which had been invaded by fever as unwholesome in almost every respect. The water-supply was in most instances obtained from draw-wells, situated close to houses and in the neighbourhood of leaking privies and defective drains, and steined with loose bricks only. The water from most of these wells has already been declared to be unfit for use by the Medical Officer of Health, and there is no doubt that they are subject to the most extensive pollution. The Report continues:—

"With regard to the disposal of excrement, the privy receptacles are in some instances merely holes in the ground, which are filled with liquid filth; in other instances they are of such faulty construction that the filth which accumulates beneath the seat does not become mixed with any ashes or other absorbent material. Overall midden privies exist to a serious extent, and it would appear that before the outbreak of fever excremental accumulations of this sort had given rise to great nuisance, owing to the scavenging not having been performed at sufficiently frequent intervals. The ground around many of the houses is littered with excrement, which has in some instances been passed by persons actually suffering from enteric fever."

This is one of the worst accounts we have ever read in these Reports, which disclose so much evidence of dirt and disease in country districts where the natural conditions of health are so good, until they are spoiled by the ignorance of the inhabitants and the carelessness and neglect of so-called "Sanitary Authorities."

THE Sheffield Town Council have had two rather important subjects under discussion at their meeting last week. The one which excited most discussion was the question whether the Corporation should apply for an Act to authorise them to municipalise the tramways; a resolution in favour of doing so was carried by forty-eight votes to four. We should doubt the wisdom of the decision; the public are probably better served in such matters by private companies. The question of "the frost and water-carriage" which was the subject of a short discussion near the close of the sitting, is in reality a far more important one than the ownership of the tramways, especially if, as one gathers from the remarks of some of the speakers, there is any idea, on the part of some at least of the Sheffield Town Council, of taking so serious a step as abandoning the water-carriage system of drainage. At all events, one or two members spoke strongly in favour of such a course, and the result was that the Medical Officer of Health was instructed to prepare a report, including an opinion as to what system was best for Sheffield. It would be interesting to know the result of this report, but if the Town Council are led to abolish the water-carriage system in such a town as Sheffield, we should think they will make a grave mistake.

IT appears that there is an unusually high rate of infant mortality at Hackney Wick, and Dr. King Warry, the Medical Officer of Health, has been making an enquiry into the matter on special instructions from the Hackney Vestry. The enquiry unfortunately seems to indicate that there is not much chance of the state of things being improved, as it arises from causes one of which at least seems incidental to the position and nature of the site. Dr. Warry observes, indeed, that where there is a collection of persons in a state of poverty,

there will always be a high rate of infant mortality, but in the case of Hackney Wick there is also the fact that the houses are built on soil formed of house refuse, supported on a bed of clay:—

"The impermeable stratum below retains the moisture in the superficial layers of soil, and as this latter contains a large quantity of organic matter, the ground air becomes damp and charged with organic and deleterious vapours, the products of decomposition. As most of the houses in this area stand immediately over the made soil, with only a few inches of air space intervening between it and the wooden ground floor—a concreted ground floor in this locality is a rarity—the atmosphere of the dwellings, especially at night, is vitiated, and produces a lowering effect upon the health of the inmates. Further, any defective drains or sewers allowing sewage to percolate into the soil in the vicinity of houses, will add further to the impurity of the ground air, and possibly by this means specific germs may be conveyed into the dwellings."

A third factor which must injuriously affect the public health in Hackney Wick is the unsatisfactory state of the sewers and drains with respect to fall. Even at ordinary times, *i.e.*, during dry weather, the sewage is standing in some of the Vestry's sewers at a varying distance from the outlets. This condition of things is much exaggerated during storms. Thus the local outlets are entirely covered, the contents dammed back under great pressure even to the house drains. As a result the soil becomes saturated with sewage."

There really seems no remedy but the demolition of the existing Hackney Wick, followed by the proper draining and concreting of the ground, before habitation on it is again entered on.

AN illustrated monograph of the Trinity Hospital at Mile End will shortly be issued by the publishing department of the Guild and School of Handicraft of Essex House, Bow. The monograph will be by Mr. Ashbee, and the illustrations by various members of the Committee for the Survey and Registration of Old Memorials of Greater London. The first edition will be limited to one thousand copies for subscribers, but we gather that the publication is not to be confined to the subscription edition. The special interest felt in the building at present justifies the publication, which comes at an opportune moment.

CONSIDERABLE interest has been aroused by statements in the daily press that on the pulling down of some old premises in Newton-street, High Holborn, for an extension of the Holborn Restaurant, the watch and seals "of Lord Lovat" were found in a chimney. On the seals are the initials, in cipher, "J. F.", with the Fraser crest and motto. But it is difficult to believe that the watch belonged to Simon Fraser, the "rebel Lord"; it is of silver, with Arabic numerals on the dial, and of the shape common in the latter half of last century; we are credibly informed that the hall-marks on the case are those of London for 1769-70.

THE fine ceiling painting executed by M. Puvis de Chavannes for the grand staircase at the Hôtel de Ville at Paris, representing "Victor Hugo offering his Lyre to the City of Paris," which was illustrated in the *Builder* of June 2, 1894, is to be engraved by M. Waltner, as a commission from the Municipality of Paris. It is to be executed as an etching "rehaussée de burin." M. Mordant is to engrave, by the same process, M. Besnard's central ceiling of the "Salon des Sciences"; and M. Lunois is to illustrate in lithography the two panels by M. Puvis de Chavannes, "L'Été" and "L'Hiver," in one of the Salons of the Hôtel de Ville. These illustrations of some of the principal decorative paintings of the Hôtel de Ville will be of considerable interest and value.

THE "Water-colour drawings in Holland and the South of England," by Mr. A. Weedon, on view at the Society of Fine Arts Gallery, are chiefly noticeable for the fine treatment of the sky in many of the drawings, as in "Approaching Storm, Katwijk" (5), "On the links at Sandwich,"

(9), and "Launching the boat" (39), a larger drawing than most of its companions, and which is a really grand composition. Among other especially good landscapes may be mentioned "Valley of the Aruns" (27), "Lexden" (37), "Boats arriving from the North Sea" (42), "The Old Rhine Leyden" (45), &c. Mr. Weedon works in a broad true water-colour style.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third ordinary meeting of the present session of this Institute was held on Monday last, at 9, Conduit-street, Mr. F. C. Penrose, M.A., President, in the chair.

Evolution of the Achaic.

The minutes of the last meeting having been taken as read,

The President announced that at the Final Examination, held from the 22nd to the 29th ult., sixty-eight persons had been examined simultaneously in London, Liverpool, and Bristol, with the result that thirty-five had passed and thirty-three had been relegated to their studies.

The names of the thirty-five who have passed, and are qualified for candidature as Associates are—

E. T. Allcock, Wakefield; H. W. Anderson, Wimbledon; J. D. Bland, Cambridge; W. Brand, Ipswich; C. S. Burgess, Edinburgh; J. McC. Cable, Bristol; E. F. Cobb, Strood, Rochester; E. R. Danford, Rotherham; E. R. O. Davis, Leicester; A. Down, Stockton Heath, Warrington; G. C. D. D. Dunn, Cardiff; H. H. Dunn, Lincoln; N. Fitzsimmons, Westminster; C. E. Flockton, Workshop; J. Ford, Stamford; L. R. Ford, London; C. M. E. Hadfield, Sheffield; O. C. Hills, London; T. W. Hooley, Heaton Chapel; E. E. Jordan, London; G. C. Lawrence, Clifton, Bristol; H. Morton, Taunton; E. Nicholson, London; W. E. K. Palmer, New Malden; G. M. Poole, Barbhead, N.B.; J. L. Redfern, Huxley; G. L. Sheppard, Worcester; G. R. Smith, South Shields; J. R. Smith, London; P. R. Smith, Richmond, Surrey; W. H. Steadman, Clifton, Bristol; A. Stratton, Liverpool; T. Turner, London; E. A. Whipple, Saltburn-by-the-Sea; K. Wood, South Shields.

"Græco-Phœnician Architecture in Cyprus."

Dr. Max Ohnefalsch-Richter then read a paper* on "Græco-Phœnician Architecture in Cyprus, with special reference to the Origin and Development of the Ionic Volute." He first gave a description of the three Royal tombs discovered by him at Tamassos, in Cyprus. These sepulchres of a Græco-Phœnician type of architecture were, he maintained, of the seventh and sixth centuries B.C. A feature of peculiar interest in these subterranean stone buildings was the direct imitation in stone of constructions of wood, and this in a perfection which had never before been met with in remains of ancient monuments. Wooden columns, windows, locks, bolts, roofs were all reproduced in stone. He had found their counterparts surviving in modern buildings of Cypriot villages. The lecturer then proceeded to give reasons for his conclusion that the Ionic volute was derived from the Egyptian lotus-flower design, and that the same origin was traceable in regard to the Greek palmette and anthemion. The theory which would ascribe the origin of the Ionic volute to the Assyrian sacred palm-tree could no longer be maintained. A small clay model of a sanctuary—evidently a votive offering—discovered at Idalion, in Cyprus, some time ago, showed again the two lotus capitals on the columns supporting the porch. Some Hathor capitals discovered in Cyprus demonstrated the fact that Cyprian artists during the Græco-Phœnician period combined Egyptian, Assyrian, and Greek elements. On one of the columns was sculptured a design of a complicated lotus-tree with winged sphinxes. Dr. Ohnefalsch-Richter next referred to Herr Koldewey, a German architect, who had put forward a new theory, in his book, "Neandria," distinguishing between three classes of archaic capitals with curved volutes—the first, with crossed lines, the Cyprian; the second, with vertical volutes, called Æolian; and the third, with horizontal volutes, called Ionic. Those three he considered

to be branches all growing out of the same trunk, which was of old Cappadocian origin, and which he declared to be the prototype. Herr Koldewey denied any connexion of the Ionic capital with Egypt or the Egyptian lotus-flower. Herr Puchstein, in his book on the Ionic capital, appeared to be of the same way of thinking. The Cappadocian columns of a baldachino from a rock-relief which had been put in evidence by the above-mentioned authors were extremely simple. The whole volute merely consisted of two spirals connected by a canal and bent downward. In the upper line of the canal of this Cappadocian capital Koldewey saw the horizontal tendency of the Ionic volute to be latent. The two spirals touched the vertical line of the shaft of the column, and in this fact Koldewey saw the vertical tendency of the Ionic volute in the same Cappadocian capital. Dr. Ohnefalsch-Richter, however, had found, during the excavations which he had carried out for the German Emperor, a small votive column even more regular and more simple than the Cappadocian column. The canal above was horizontal and was covered already by an abacus. The spirals also touched the shaft with their inner and lower parts in a more finished and regular form than in the Cappadocian example. He maintained that the columns from Cappadocia, Cyprus, the oldest archaic Ionic volutes from Urya, Olympia, and other places were simplifications of much more complicated Græco-Phœnician volutes, which on their part were derived from the Egyptian lotus. A reference to the architectural details of one of the three Royal tombs of Tamassos showed how a complicated lotus-design was changed into a more simple form, and thus prepared the way for the formation of the Hellenic Ionic volute. From an interesting series of Græco-Phœnician Cyprian capitals, with palmettes over the volutes, to which Dr. Ohnefalsch-Richter referred, he showed that the three types of capitals classified by Koldewey actually occurred in Cyprus. The Ionic volute, with its beautifully-ornamented cymation, which belonged to the archaic temple of Diana, at Ephesus, and which had been lately pieced together by Dr. A. S. Murray from fragments in the British Museum, he fully admitted to be the oldest existing example of a pure Hellenic Greek volute. He referred to Dr. Murray's paper, lately read before the Institute, showing the great importance of the Ephesian capital preserved at the British Museum, especially since its no less valuable twin-brother the well-known Samian capital had disappeared. As a last illustration, Dr. Ohnefalsch-Richter exhibited a photograph of an Ionic Greek capital now in the Cyprus museum at Nicosia, and discovered at Larnaca in 1879. In this case there was no ornamental cymation properly speaking. The sole decoration below the lower margin of the canal and the spiral consisted of two palmettes or lotus-flowers growing out of the corners. The upper and lower margins of the canal were not straight, but considerably concave, and both lines ran parallel to each other. The proportions of the capital were very harmonious and Greek, but it was difficult to date it. The concavity of the lines of the canal seemed to point to a later column than the archaic Ephesian volute of the Artemisium.

Professor Aitchison proposed a vote of thanks to Dr. Richter, and prefaced his remarks by expressing his pleasure at seeing Mr. Falkener with them that evening. It would be imprudent on his part to say how long he had known Mr. Falkener, but he had always received the greatest kindness from that gentleman, as well as instruction from his admirable works, which had made his name celebrated through every architectural centre of the world. Referring to Dr. Richter's paper, he did not know when he had been present at a meeting of the Institute at which he had heard so profoundly interesting a paper. Every one who had begun his architectural studies with the Classic must have taken the most profound interest in the Ionic order, and probably made theories of his own as to how it had originated. He must confess that his own theories on the subject appeared to have been far from the truth, for he had always supposed that the Greeks, being a maritime people, and living mostly on the sea-shore and on islands, must have taken their idea of the Ionic capital from the univalve shells, which they saw so plentifully about them. However, it seemed that the origin of the Ionic capital was not an animal but a vegetable one. The forget-me-not buds and opening ferns were striking illustrations of the plant spirals. Doubtless these discoveries lately made at Cyprus gave an over-

whelming probability, even a possible proof, that the first idea of the Ionic capital came from the lotus. It would be interesting to have some examples of the spirals which the lotus flower formed. Like many theories, one could not at present carry it further, though when once suggested it carried an irresistible conviction to the mind. The canal of the Ionic capital must, he thought, have been suggested by some of the shells they saw, but that would not affect the origin of it being from a plant, probably from the lotus. Dr. Richter had pointed out how wonderfully similar an example on his second sheet was to the celebrated internal capital of the Temple of Apollo at Bassæ. The way in which the abacus of this capital had been managed was one of the great marvels of the skill of the Greeks, almost everything they touched exhibiting the extraordinary qualities with which that great people were endowed. Dr. Richter had referred to mortar as being used in these graves at Cyprus. He (the speaker) when he went to Egypt was under the conviction that the Egyptians had not used mortar, but when he visited the great Pyramid of Gizeh he found every stone had mortar joints. In the chamber of the king and of the queen every joint of the great slabs which formed the roof were filled with mortar. He brought home specimens of this mortar, and, on having it analysed, found that the exterior mortar was composed mainly of lime and sand, while the interior mortar, although containing lime, was principally composed of plaster-of-Paris. The joints which had misled so many of the antiquaries into the belief that they were, like the Greek joints, dry, were simply a device to give a more elegant appearance to the masonry, while within the joints there was a channel on both sides, so that the mortar acted as a continuous tie between them. He, unfortunately had no acquaintance with Egyptian dates, but if, as he presumed, the Pyramids of Gizeh were very much older than 600 B.C., it was not surprising that mortar was found at Cyprus.

Sir H. Bulwer (late High Commissioner to Cyprus) said he had much pleasure in seconding the vote of thanks. The subject of the paper was so technical that he hardly liked to commit himself to any words about it, and certainly not to any expression of opinion. His acquaintance with the writer of the paper dated back a great many years, for when he went to Cyprus in 1886 Dr. Richter had already been there for some time. It was in Cyprus that Dr. Richter began his archaeological education in the most practical manner, not in the schools or from lectures or books, but by practical investigation in that ancient and classic soil. Dr. Richter afterwards proceeded to Germany, and was there able to correct some of his earlier impressions, and to add to his knowledge. Whatever might be their conclusions on the question put before them that evening, viz., the origin of the Ionic volute, he for one did not pretend to offer any opinion, but they would be all agreed that they had heard a most interesting and suggestive paper.

Mr. Falkener remarked that he did not recollect having seen in Egypt examples of the Ionic column. He had discovered a Doric one, but had never seen any Ionic examples. He did not remember Dr. Richter saying anything about Lycia. Dr. Richter had mentioned that in Cyprus was to be found the imitation of woodwork in wood and stone buildings, but in Lycia the most perfect representations of woodwork existed in the monuments. Referring to the question of the mortar, it had brought to his mind monuments which had none, as in the Parthenon, where the joints were so fine that it appeared to be all marble. In Corinth, again, there were remarkable examples. The temple there was not in such a beautiful state of preservation as the Parthenon, for in Corinth a great number of holes had been bored into the columns, in order to find the small cramps in the centre. The paper, he considered, was an interesting and suggestive one.

Mr. Alma Tadema, R.A., said he had come there that evening to hear something about the origin of the Ionic volute. He had sometimes studied the question, and had always come to the conclusion that Cyprus was more or less a centre where outgoing streams of civilisation from the countries all around found root, and especially from Phœnicia. Greek influence also existed, but he had never seen his way to accept the idea, which was put forward a few years ago, that Cyprus might have had a great influence upon Greek civilisation and architecture. The capitals of the seventh and sixth centuries B.C. were

* This résumé of the paper, which has already appeared in the *Times*, was drawn up by Dr. Richter himself, and therefore we give it as his own expression of his views in an abbreviated form.

constructed as horizontal members, and he could hardly believe that architectural forms would go diametrically in opposition to an origin which was perpendicular. The principal form of the Ionic capital being horizontal, he could not get away from his first belief, that the Ionic capital had found its first idea in Assyria, and he was sorry that he had to sit down unconvinced by what Dr. Richter had said.

Mr. R. Phénix Spiers said he had also formed theories as to the origin of the volute. He confessed it was somewhat difficult to contend against what had been said that evening, and there was no doubt that, when they had the paper before them, they would be in a better position to judge of the question. There was one direction in which Dr. Richter had not turned, viz., the metallic treatment of the ornaments which had been referred to. The drawings on the walls seemed to point to wooden construction translated into stone through beaten metal. He (the speaker) some time since had prepared a drawing which would illustrate what he referred to, showing a canopy which, it was surmised, was originally constructed in wood, and covered with metal. If the drawing was closely examined, it would be seen that the shaft was the trunk of a palm-tree. He believed that many of these examples were derived from metal forms beaten on to wooden structures, and he would draw attention to the fact of how the metal had played an important part in the decorative forms shown by Dr. Richter. These forms to his mind were all metallic forms. Where the records failed was due to the fact that all the features which were originally made in wood had entirely perished. The description given by Herodotus of the structures in Media, in Ecbatana, was that the palace had peristyles with columns in wood, covered with plates of silver. The dates of these might extend back long before the representation of the lotus in Egyptian decoration, or at least as far as 2500 B.C. The point he wished to insist on was, that it did not follow, because a certain decorative form was found at Egypt at some period, that some other nation under the same conditions had not actually invented the same forms.

Mr. Sydney Vacher said that Dr. Richter seemed to argue that the Ionic capital was traced from Egyptian work, but he would like to ask where he had found Phœnician work. One was always led to believe that the Phœnicians were an earlier nation than the Greeks, and, on examining the ornaments, it had always struck him that the early archaic Phœnician and Greek work must have come from the Assyrians. It was a difficult question to say whether Greco-Phœnician work came from Assyria or Egypt.

The President said they were extremely indebted to Dr. Richter for the very interesting and suggestive paper he had given them, upon a subject which was not yet wholly settled, though at the same time the lecturer had brought before them one of the elements for settling it. Dr. Richter had submitted, in a very interesting manner, additional evidence of the stone architecture which they knew so well, and of the final Greek work having originated from wooden construction. This, however, had been brought before them from another direction, in a work of the late Mr. Fergusson, who, in his introduction to the *Antiquities of Ionia*, said: "We now know practically, from our experience of Lycian tombs and Indian cave temples, what the process was by which the wooden style came into lithic architecture. At first it is by copying literally every detail of the carpentry—the tenons, the mortises, even the pins and fastenings are all reproduced in stone without any difference except in material. By slow degrees, sometimes after centuries, these wooden forms are gradually abandoned, and are replaced by others more suitable to the material, but seldom if ever without leaving such reminiscences of their origin as to enable anyone accustomed to such enquiry to tell at a glance their original parentage." Another point raised was the lime mortar, and that created no difficulty in understanding that in the very early capital at Mycenæ, the steps were rubble-stone, covered with very fine lime cement. These had been several times mended with the same material, so that although they did not show it as a rule, they knew perfectly well the use of lime. As to the origin of the Ionic capital, he believed this was one of the sources from which it had originated, but not the only one. The Greeks were open to suggestions from other sources, and they no doubt must have seen in the Phœnician buildings in Cyprus, and at Tyre and Sidon, works of this kind, as also some things in Egypt, though he was not aware

of anything so nearly approaching the Ionic capital as the examples on the wall seemed to be. At the same time, they had a very distinct difference, which Mr. Almi Tadema had called attention to, viz., the horizontal character of the real Ionic, as compared with the semi-vertical character of the Cyprus examples. He believed it had originated in a different way, viz., from the very simple spiral used so frequently in the ornaments at Mycenæ and Tiryns, which were derived from Egypt, because there were examples of spiral work in Egyptian ornaments, like the ceiling at Orchomenus in Greece. In that case the spiral had equal developments at every turn, but then the Greek mind was always anxious for beauty, and the improvement went much nearer to Professor Aitchison's view of the expanding spiral shell. If they had had a volute of the exact form of the expanding shell, they would be kept to the equi-angular spiral. The curve used in the Ionic capital could be rendered, line for line, by a string carried round the first old-fashioned equi-distant spiral, which could itself be produced by a string carried round a cylinder. Having got that, they put the string on the spiral, and by this means produced their beautiful expanding spiral which formed the Ionic capital. This he had proved for himself, both in diagram and model. From the capitals of the Erechtheum, the Propylæa and other examples, he had no doubt that the ultimate Ionic capital was so produced, but the original idea had been helped by those Phœnician forms, which probably came from Egypt or Assyria.

The vote of thanks was then put to the meeting and carried by acclamation.

Dr. Richter replied, and said that with regard to buildings of stone imitating wooden architecture, he was aware, so far as books were concerned, of what had been found in Asia Minor and other countries. When they saw the illustrations accompanying the printed paper, he believed they would admit that there existed nothing whatever like what had been found in these graves. He did not know anything similar of wooden architecture imitated in stone to the columns on the door, the windows, the sills, the locks, bolts, &c. With reference to Mr. Spiers' remarks, most of the works he (the speaker) could name were in metal, bronze, silver, and gold. As to the influence of Egypt and Assyria, the question was a very complicated one, and he could only touch upon it with a few words within the limits of his paper, though he could dwell for a week upon it. It should be remembered that Assyria did not exist by itself. At a certain period the lotus-flower pattern went from Egypt to Assyria; but the origin was in Egypt. Then there was the combination of the sacred trees, where also elements of the palm-tree were used, as appeared from Mr. Tylor's excellent paper. With regard to the Greek Ionic volute, he had only desired to lay before his hearers the proposition that the Greeks had created their own art, but that one of the elements they used, and perhaps the principal element, was to be found in the lotus-flower.

The President announced that the next meeting of the Institute would be a business one on January 13, 1896, when the award of prizes and studentships would be announced.

The proceedings then terminated.

GLASGOW TECHNICAL COLLEGE:

THE ARCHITECTURAL DEPARTMENT.

The medals and prizes won by the students of this department of the College at the recent Science, Art, and Technological Examinations were distributed on the 10th inst. by Mr. John Honeyman, A.R.S.A., F.R.I.B.A., the representative of the Glasgow Institute of Architects on the governing body of the College. Mr. Thomas Russell, of Ascog, presided.

After a statement had been made by Professor Gourlay as to the honours which had been won, Mr. Honeyman addressed the students, and said:—"There is one reason why I hardly regret the opportunity of briefly addressing you, and that is from the nature of the classes represented here. I feel that it is my duty to-night in one respect most heartily to congratulate you on the most excellent arrangements which exist in this College now, and the energy of my friend Professor Gourlay. I must congratulate you also on another point, that you had the good sense to avail yourselves of this opportunity. That is, I am glad to see, becoming more common, but it is not unusual. Of course, I must congratulate those who have won the prizes, and I think the record which Pro-

fessor Gourlay has read shows that these have been won with very great distinction, and reflect honour not only on you but on Professor Gourlay and his assistants. I congratulate you sincerely on that. Knowledge is power. There are two kinds of knowledge, that which we gain from other people's experience and that which we gain ourselves. A good deal is being said about shortening the years of apprenticeship, but I think you will find it true that it will be no gain to shorten the term of your apprenticeship. You must attain a certain amount of practical experience. The knowledge you get here is to help you to use that experience and to enlighten and enliven your intellect. When you are freed from ignorance about a great many things you will have more ability to grapple with the difficulties that arise. When I commenced business an apprentice was never set to work at all. He was set to learn what he now learns in the Technical College, and nowadays an apprentice is set to work at once. There is no profession where experience is really of more value than that of architecture, but I am sorry to say there is no profession where experience is less valued by those outside of it. There is a sort of idea (I address our architectural friends more particularly) that some seem to think that they can make our architects artists by teaching them an artistic style of drawing and colouring. Now this is a very great mistake and a delusion. The essential characteristic of a good architectural drawing is that it should be perfectly intelligible."

Mr. Honeyman then distributed the prizes. Mr. David Thomson, architect, then addressed the meeting, and referred, as a past-teacher, to the development of such classes.

A hearty vote of thanks to Mr. Honeyman was proposed by Mr. T. L. Watson, F.R.I.B.A., President of the Glasgow Institute of Architects, and a similar vote of thanks to the Chairman, proposed by Mr. Malcolm S'ark, jun., Honorary President of the Glasgow Architectural Association, concluded the meeting.

An exhibition of "Testimonies of Study" was held in the architectural studio of the College that day. The drawings were those which had been accepted in the three examinations of the Royal Institute of British Architects, and were executed by students of the College, who had passed the examinations.

THE CONSETT IRONWORKS.

ON Wednesday the members of the Northern Architectural Association, which has its headquarters at Newcastle, paid a visit to the Consett Ironworks.

These works, originally established in 1840, are situated at Consett, about midway between Newcastle and Durham, on the Derwent Valley Branch of the North-Eastern Railway.

The staple trade is iron and steel plates, steel angles, bars, &c., beside which the company are large coal-owners and manufacturers of coke, both for consumption at their own blast-furnaces and for sale.

The company's blast-furnace plant consists of seven furnaces, 55 ft. high by 20 ft. diameter of bosh, equipped with Cowper's and Whitwell's fire-brick stoves for heating the blast, which enters the furnaces at a temperature of about 1,300 deg. Fahr. There are four pairs of beam-engines for raising the blast for the furnaces. At present five furnaces are in blast, producing Bessemer pig-iron, of which the average yield per furnace is about 750 tons weekly, but as much as 919 tons in a week have been obtained from one furnace.

The largest proportion of the iron ore used is procured from the company's mines near Bilbao, in Spain, but quantities of other high-class minerals are also used in conjunction therewith.

The waste gases are utilised for heating the stoves, and in raising the steam for driving the blast-engines. There are altogether some thirty-one boilers in connexion with the blast-furnaces, nineteen of them egg-ended, and twelve double tubular.

When iron plates were exclusively used for shipbuilding purposes the plant of the company was almost entirely devoted to the manufacture of plates of this material, and for this purpose they had 170 puddling-furnaces and 7 plate-mills, and turned out about 1,900 tons of iron ship-plates weekly, but with the large substitution of steel for iron some portions of this plant have become obsolete, whilst others have been modified for the purpose of producing steel, and at the present time there are only forty puddling-furnaces and two plate-mills for the production of iron plates. These latter are at the old "tin-mill"

works, at which place also iron chequered plates are rolled.

The company commenced the manufacture of Siemens steel in the year 1883 in a small way at first, gradually extending their operations until they have now three steel melting shops, with a total of 25 melting-furnaces, the ingot-producing capacity of which is 5,300 tons per week.

The valve-chamber at the north shop is a special feature, being of unusually large dimensions, with sufficient room for walking round the valves, and space for a railway, which runs the entire length of the chamber and is used for taking the necessary material in and out. The casting-pits are parallel with the lines of melting-furnaces, and in front of the latter. Each melting-furnace has its own ladle and carriage. The ladle is dried by means of gas from the producers, and is always in readiness so soon as the charge is melted.

Large locomotive cranes are employed in the melting-shops in lifting the "moulds" into the pit ready for receiving the molten steel from the ladles, in stripping the moulds from the ingots, and in removing the latter for manipulation in the cogging and rolling mills. The gas producers are at the back of the melting-furnaces and below the level of the latter. They are of the ordinary Siemens type, blown with steam, and the gas is conveyed from them to the melting-furnaces by overhead tubing. A special feature in connexion with the producers at the north melting-shop (angle mills) is the railway facilities, which are designed with a view to enable the coal to be brought to them without shunting.

There are two cogging-mills for dealing with the plate ingots after leaving the adjacent melting-shops. No. 4 cogging-mill plant, which is capable of cogging 2,000 tons of steel ingots weekly, consists of a 45-in. mill and engines for driving it, together with hydraulic slab-shears and engines and seven heating furnaces.

The company have four plate-mills for steel plates (Nos. 1, 2, 3, and 4). Each of these plate-mills has one stand of roughing and one stand of finishing-rolls, driven by separate high-pressure, direct-acting, non-condensing, fly-wheel engines. Nos. 2 and 4 mills are "reverse-mills." Nos. 1 and 3 pulling-over mills, a steam-lift being provided to each, whereby slabs weighing twenty to twenty-five cwt. each can be dealt with. Steel chequered plates are made at No. 3 mill. Steel plates of a light character are rolled at Nos. 1 and 3 mills, those of medium thickness at No. 2 mill, and the largest and heaviest plates in No. 4 mill. A short time ago the company rolled in No. 4 mill, for a West Hartlepool ship-builder, some plates of very large area, the finished dimensions being 60 ft. 2 in. by 4 ft. 2 in. by $\frac{3}{4}$ in. thickness. On the receiving side of the finishing-rolls of No. 4 mill there is an arrangement of live rollers, and on the delivery side of the same a traversing platform is provided for carrying the plates in process of manufacture from the roughing to the finishing-rolls. The average weekly production of finished steel plates in this mill alone is about 1,100 tons.

The angle-mills, which are of recent construction, are contiguous to the north melting-shop, and cover an area of about 16 acres. They are provided with the most modern plant and machinery, consisting of a 45-in. cogging-mill, with a bloom cutting-shear; a 32-in., a 22-in., and a 12-in. guide-mill, all with their necessary engines, live roller gear, billet-skids, heating-furnaces, boilers, hydraulic plant, overhead cranes, hot-saws, billet and scrap cutting-shears, bar-banks and bar-skids, together with the other needful accessories, the whole being designed for a production of 1,500 tons of sectional steel of every description, such as angles, tees, bulbs, channels, girders, round and square bars, &c.

The company have also a laboratory with necessary apparatus for the examination of materials received and produced in the operations connected with the various manufacturing processes, a "test-house," containing three Bucton's testing-machines, tensile test preparing machines, powerful bending and drilling machines, and all necessary appliances for carrying out the tests required by Lloyd's, Bureau Veritas, Board of Trade, Admiralty, and other surveys. At the brickworks, 120,000 bricks are turned out per week; ordinary fire-bricks, blast-furnace lumps, and other firebrick articles used in the various departments are made here.

The company own about 2,700 cottages at Consett, Blackhill, Leadgate, and the outlying districts, and recently have commenced the construction of an entirely new village which will

consist of between 300 and 400 houses of various types at Chopwell. They employ upwards of 6,000 hands, the wages at present paid amounting to about 416,000l. per annum. Mr. George Ainsworth is general works manager, and Mr. Henry Holliday secretary to the company.

EXPERIMENTS IN SEWAGE PURIFICATION.

A DISCUSSION on sewage purification took place at the Sanitary Institute on the 11th inst., when Sir Benjamin Baker, Pres.I.C.E., presided, Sir Douglas Galton opening the discussion by reading a paper entitled "Lessons to be learnt from the Experimental Investigations by the State Board of Health of Massachusetts upon the Purification of Sewage." The paper reviewed the experiments of Schloessing, Frankland, Warrington, Bailey Denton, and Baldwin Latham, and the results of mechanical filtration by the Lowcock and other English processes up to the point where the Massachusetts experiments with sand filters commenced. The early experiments of the Board as summed up by Mr. Hasen, the chemist to the experiments, showed that the power of any material to purify sewage, depended almost entirely upon its ability to hold the sewage in contact with air. The material must hold both air and sewage in sufficient amounts. Mr. Lowcock and Mr. Scott Moncreiff in this country, and Mr. George Waring in America, had succeeded in constructing filtering-tanks which gave excellent results, working effectively and permanently with hundreds of thousands of gallons of sewage passing through them annually. In the American experiments it was found that the thin layers of sand on the top of the aerators were, at the last, black with sulphides, but all the materials below were sweet and clean. All the impurities had been detained and destroyed. It was found that practically all the solid matters were deposited in the central core during the downward flow of the water, and that very little water remained to be done as the liquid rose in the outside ring. This was the case even when the sewage was applied at the maximum rate of 8,050,194 gallons per acre with the water moving through the tank at the rate of about 3 ft. per hour. The American sanitary engineer, Mr. G. Waring, in these experiments carried out at Newport, U.S.A., in 1894, had pursued the investigation on a practical scale, with a somewhat different arrangement from Mr. Lowcock's. The main features in both were the "strainer" and the "aerator," the function of the strainers being mere mechanical sedimentation. At the beginning of the experiments the effluent showed little or no improvement. Gradually, however, the organisms of nitrification began to multiply, and to seize upon the dissolved impurities, destroying their organic character, and transforming them into nitrites and nitrates, in which unobjectionable form they escaped. Once started, this action continued and increased rapidly, and by the end of the month the average rate of nitrification was reached. From that time to the end of the experiment the operation of the tank was practically constant. At the end, when the tanks were taken apart, the conditions clearly indicated that the usefulness of the filters had been in no way impaired, that they were capable of performing their functions indefinitely, and that, under proper management, no renewal of the filtering medium would be necessary. The principal conclusions to which the experiments led were—

1. The suspended matters of sewers (sludge) can be mechanically withheld by straining slowly through suitable material.
2. The filth accumulated by this straining material can be destroyed, and the straining medium restored to a clean condition by mere aeration.
3. The successive alternate operations of fouling and cleansing can be carried on indefinitely without renewal of the straining material.
4. The purification obtained by this straining process practically equals that accomplished by chemical precipitation, and is sufficient to admit of discharge into any considerable body of water not used as a source of domestic supply, or for manufacturing purposes requiring great purity.
5. Such filters can be maintained in constant and efficient operation by suitable aeration.
6. The erection of a plant capable of purifying large volumes of sewage upon a relatively small area calls for no costly construction. Repairs and renewals are merely nominal. The attendance required is but slight. There is no outlay for

chemicals, &c. The only expense of mechanical operation is the driving of the blower or air-compressor.

7. The process admits of wide variation in the selection of filtering material, and nearly every community can find, in its local resources, something suitable for the purpose.

After a few words of compliment to the lecturer the Chairman called upon

Professor Corfield, who in opening the discussion said the Massachusetts experiments confirmed the prior English experiments, and, though they had gone further, it was in that confirmation that their chief value lay. Frankland, Bailey Denton, and Baldwin Latham had shown that sand and gravel would be a satisfactory medium of filtration if the sewage was made to pass through them, and so long as that was the case the results were found to be as good in the winter as in the summer. These results revealed nothing that had not previously been revealed in the results of the experiments made by the Sewage Committee of the British Association.

Mr. Lowcock agreed with Professor Corfield in regarding the results as only confirmatory. If in England they had had the same opportunities which had been given to Mr. Waring in America they would have had as good results. He was, of course, glad to see Mr. Waring confirming his own results. They had introduced some recent improvements which permitted of the cleaning of one small section of the beds at a time while the rest of the filter was at work. In comparing results, the different characteristics of the sewage treated should be considered. The sewage in Massachusetts was only of one-third the strength of that at Wolverhampton, which was altogether abnormal. At Malvern Link where the sewage was strong but more constant than at Wolverhampton, the oxidation amounted to 99 per cent. of the oxygen consumed. In their filters a thin layer was skimmed off about every six weeks. This was first put on a platform to dry, then turned over, and in ten days it was perfectly clean.

Mr. Scott Moncreiff said that when he began his investigations he had not before him the Massachusetts experiments, and he had to adopt plans of his own. These plans he continued. The main results referred to in Sir D. Galton's paper would, he believed, be viewed in a very different light in a short period. Some of these results would, no doubt, always remain of great importance, but in the near future it would certainly be held that biological processes were unsatisfactory unless the whole of the contents of the filters were completely dealt with, so that all the organic matter became liquefied, and no sludge of any kind remained.

Dr. Rideal referred to the very various functions performed by apparatus to which the term filter was applied. He thought the term misleading when applied to such processes as Mr. Waring's and Mr. Lowcock's. It would be better to adopt Mr. Waring's words, "strainer and aerator." It was very important to form a clear idea of what the process of nitrification was. That term should not be applied to the preliminary process of breaking down the organic matter, as it too often was.

Mr. Binnie, Engineer of the London County Council, who was next called upon, said that Mr. Dibdin and himself had been compelled to give very serious attention to this subject in trying to find out how to get rid of 180,000,000 tons of sewage annually with the least possible nuisance. They had carefully considered the Massachusetts experiments and others which had been made in the same direction, and they had come to the conclusion that no filter would get rid of 2,000,000 tons of sludge or of the 200,000 tons of dry solid matter they had to deal with. They had been experimenting many months to discover a material through which they could with the greatest effect and economy pass their effluent. They thought that it was necessary in some way or other to force in a large amount of oxygen, but their first attempts did not succeed much better than a similar attempt of his predecessor Sir J. Bazalgette, who had water mixed with sewage continually pumped up over and over again in order to expose it to the air. Mr. Dibdin and he had tried to force air into the sewage—in fact, to make soda-water of it, but still they found no great improvement. After many experiments they came to the conclusion that it was not only necessary to bring the sewage into contact with air, but that this must be done under peculiar circumstances. The surface of exposure must be very large, it must be kept wet, and the flow should be properly regulated. Their first nine months'

experiments were mainly directed to finding the best material through which to pass the effluent (not the sludge). They wanted to remove a large quantity of organic matter, and they came to the conclusion that coke-breeze was the best material. They constructed a filter of one statute acre in extent, and the results had been made public by Mr. Dibdin. In the bottom was formed an ordinary tile drain, covered with about 2 ft. 6 in. of coke breeze, and 6 in. or 8 in. of sand on the top of that to prevent the coke from floating out. The strainer was filled as rapidly as possible, and then they drew off. The water was drawn off through the interstices of the coke, but as fast as it was drawn off air went in to take its place, and they had no necessity for any air-pump. They thus treated 2,000,000 of gallons from which they had eliminated 75 per cent. of the organic matter, and obtained a sewage effluent perfectly unimpeachable. It had no taste and no smell, but they had evidently not quite perfectly done their work. They found subsequently a growth from end to end of *vorticelli*. Thus Nature completed their operations. At present, they were sending back into the Thames an effluent as pure as the water of the river itself.

Sir Douglas Galton very briefly replied, stating that the discussion had fulfilled the purpose he hoped to obtain. He never supposed it would apply to London. Any system applicable to London would necessarily be of a very special character, but he thought it had been shown that the process adopted by Mr. Lowcock in England or that by Mr. Waring in America, if introduced into the various provincial towns of England, would prove to be an economical method of treating sewage. A vote of thanks was accorded to Sir Benjamin Baker for presiding, on the motion of Mr. Rogers Field.

AN AUSTRALIAN OPINION ON TILES AND SLATES.

The following remarks are from a paper on "Roof Coverings," recently read before the Engineering Association of New South Wales, by Mr. James Nangle:—

"In a good roof-tile, the chief consideration is lightness as far as is consistent with homogeneity of substance; for it is to be remembered that to prevent the soaking of water, a fine-grained, compact, almost vitrified body, free from impurities, must be produced. This result is only obtained by judicious selection, and sufficient weathering of suitable clays, thorough grinding, and kneading, and what is equally important, careful burning. Those of the foremen make give evidence of plenty of weathering and working, but at the same time, are not, as a whole, very compact, being filled with elongated crevices, between what might be called layers or fibres. The layers are very distinct, and indicate a very tough clay. The colour is very uniform, while the design is undoubtedly ingenious, and admits of most effective fixing, and security against the inroads of the weather. The table which has been prepared by the author shows the results of some experiments as to the water-soakage of these, as well as other tiles, compared with slates. Several varieties of English-made tiles are to be obtained, and some which have been brought under the notice of the author, attain to the standard of a good average. The best, though certainly not of a pleasing red colour, are at the same time possessed of an extremely compact body, uniformly burnt, and capable of very effective resistance to water. It is to be feared, however, that these tiles, while almost perfect in other directions, are liable to crack under the process of rapidly-changing temperature. The colonial manufacture are made heavier, and show absence of clay weathering, as well as the presence of a full supply of impurities, though it may be remarked they do not attain to such a large water absorption as some of the imported tiles. There is nevertheless a much larger soakage than can be good, especially as the impurities present are most likely to be acted on by the water, to the destruction of the tile. The colonial tiles would, it might be suggested, be the better if less in thickness and a greater degree of burning. Exceptionally good raw materials are to be found for tile-making, and it only needs some encouragement for the production of better tiles. Some of the tiles produced in years gone by were very carelessly made, and the result by using them so disappointing that their manufacture and extended use was grievously retarded. The entry of the imported article, together with the improvements of our buildings, has awakened and given fresh life to the industry, and we are likely

to have a vastly better article from our own manufacturers.

Amongst all the materials which we are accustomed to use in covering out-buildings, none can excel a good slate, possessing, as it does in such an eminent degree, all the chief qualifications to fit it for the purpose. It is almost proof against water; it is not influenced in a great degree by contaminated atmosphere, stands change of atmosphere as well as most other materials, and, while obtained in abundance, is easily manipulated by the workmen, and looks well on the roof. It is, of course, to be marked that a good slate is so described, for in common with all other things there are varieties in quality, and we have only to look at some of the roofs around us to find slates, the quality of which is evidently

the old colonial buildings were roofed with these slates, and on those which have survived, the slates will be found as good as the day they were put on. Colonial slate does not seem to offer much opposition to the imported article—indeed, it would be rather difficult to obtain any colonial roofing-slates at the present time. That there is good slate for the purpose in this, as in the other colonies, has been amply demonstrated, and there is enough to justify the opinion, that if the quarries were properly developed, our buildings might have more colonial slate on them than they have at the present time."

The following is the table of water-soakage of tiles and slates, referred to in the first paragraph of the above extract, which may be of interest to our readers:—

TABLE SHOWING ABSORPTION OF WATER BY DIFFERENT VARIETIES OF ROOFING TILES AND SLATES USED IN SYDNEY.

Specimens thoroughly dried prior to immersion. Time of immersion, 24 hours.

No. of Specimen.	Description.	Size.	Weight Dry in lbs. and ozs.	Weight Wet in lbs. and ozs.	Absorption in ozs.	Percentage of Porosity.	Weight per S. square Wet in lbs.	Remarks.
1	Foreign Terra-cotta Corrugated Tiles.	9½ in. by 1 ft. 4½ in. by 7-16 in.	4 10	5 9	15	20.7	751	Completely saturated at expiration of immersion. Light Red Colour.
2			4 14	5 12½	14½	18.58		
3			5 2	6 2	14	17.37		
4			4 9	5 8	15	20.54		
5			5 2½	6 1	14½	17.57		
6	Colonial Terra-cotta Corrugated Tiles same pattern as Foreign Manufacture.	9½ in. by 1 ft. 4½ in. by 11-1 in.	5 3½	6 0	12½	14.97	1,063	Completely Saturated. Full Red Colour.
7			6 14	7 10	19	10.90		
8			7 3½	8 1	13½	11.68		
9			7 3½	8 1	13½	11.68		
10			7 12½	8 11	14½	11.64		
11	English-made Tiles.	10½ in. by 6½ in. by ½ in.	2 10	2 13½	3½	8.31	1,495	Hard—Close Grained—Partially vitrified. Dark Red Colour.
12			2 6	2 9	3	8.30		
13			2 9	2 13	4	9.75		
14			2 9	2 11½	2½	6.09		
15			2 10½	2 10	1½	3.70		
16	English-made Tiles.	10½ in. by 6½ in. by 7-16.	2 10½	2 14	3½	8.73	1,754	Very hard—vitrified—dark red or brown in colour. Section showed after immersion very little water penetration. NOTE. Brown Colored Tiles showed smallest absorption.
17			2 5	2 6	1	2.70		
18			2 4	2 4½	½	2.08		
19			2 3	2 4	1	2.85		
20			2 4	2 4½	½	1.38		
21	Bangor Purple Slates.	20 in. by 10 in.	2 4½	2 2½	2	5.47	580	Very closed-grained and compact. Slate completely dried in 45 min. in a temperature of 65 deg.
22			2 5	2 2½	2	5.47		
23			2 15	2 15½	2	1.06		
24			3 4	3 4½	½	1.48		
25			3 7	3 7½	½	1.04		
26	Common American Slates.	20 in. by 10 in.	3 12	3 12½	½	1.25	653	
27			3 0	3 0½	½	1.01		
28			3 2	3 11	1	.51		
29			4 0½	4 2½	1	1.94		
30			2 12½	2 12	0	1.50		
31			4 7½	4 3	1½	2.27		
32			4 4½	4 5	½	1.09		
33			3 3½	3 5½	2	3.18		
34			4 2	4 2	0	1.11		

very bad. Cases have passed under the notice of the author where slates, perhaps not more than ten or twelve years in use, have decayed to a state little better than brown paper. The source of such rottenness may be found in the large percentage of iron sulphide, the weathering of which has tended to utterly disintegrate the substance of the slate. If such slates were examined prior to being placed in exposure they would be found to be full of such impurities. Again, a slate which is soft and clayey, can no more endure than a piece of rotten sandstone—each will quickly crumble and collapse when subjected to the effects of the weather. The inferior kinds are found among those known as the common blue slate, obtained from America. A peculiar feature connected with the American slates is the want of uniformity in any one lot, and whether examined prior to fixing or after a few years' use, the great difference is most evident. Some weather well, others discolour, soften, and crack, and in a short time the slated surface is both unsightly and insecure. Whether this result is due to injudicious mixing of different qualities in commercial manipulation, or owing to great variety in the slate rock, is not clear. The same unfortunate trouble, during the practice of the author, has arisen when using what is looked upon as a better quality of American slate. Those from the Welsh quarries are, it is pleasing to note, almost entirely free from such defective qualities, and, if properly laid, only the greatest satisfaction can accrue from their use. The purple variety, though not more compact in grain than the blue, finds the most favour, and, if the evidence of experience can be taken into account, is certainly the best. Any iron present has been almost completely oxidised, thereby preventing troubles from this source, while the colour permits in most cases the arrangement of harmony in the effect of the structure. Many of

COMPETITIONS.

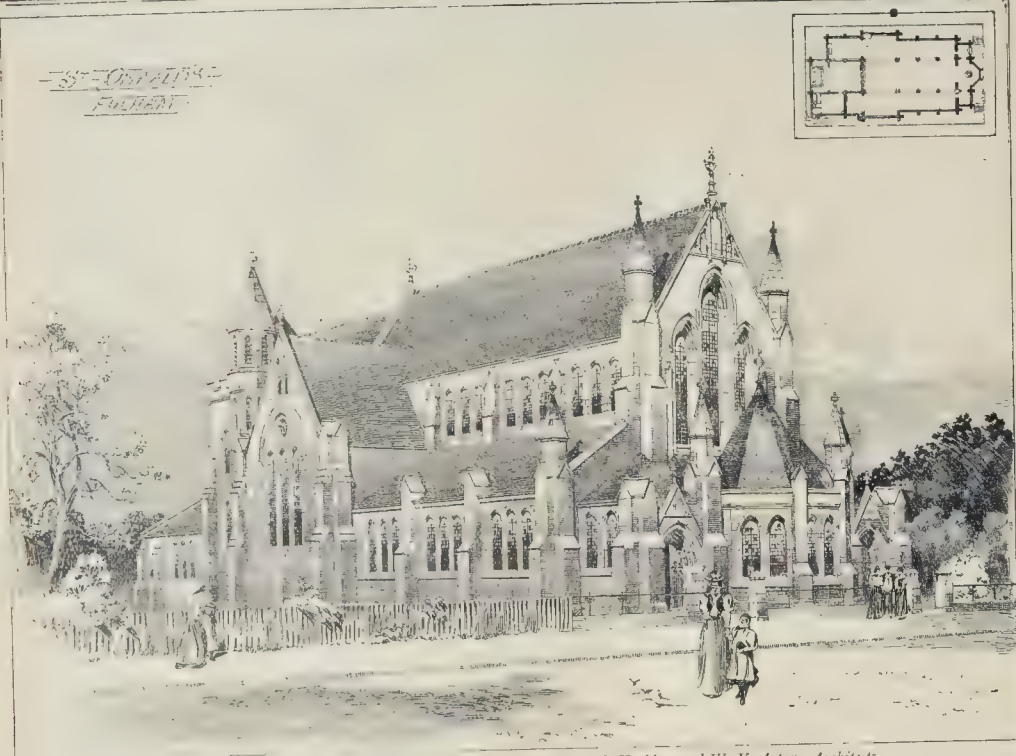
TECHNICAL SCHOOLS, HYDE, CHESHIRE.—The Technical Instruction Committee of the Borough of Hyde, Cheshire, has recently decided a limited competition in designs for a new Technical School and Free Library. Five architects were invited to send in designs for competition, and those submitted by Messrs. Woodhouse & Willoughby, 100, King-street, Manchester, were successful.

COUNTY INTERMEDIATE SCHOOLS, WELSHPOOL.—The Governors of the County Intermediate Schools at Welshpool have entrusted the firm of Messrs. Woodhouse & Willoughby, of Manchester, with the duty of assessing the competitive designs for their new School Buildings.

CHURCH, HETTON-LE-HOLE, DURHAM.—In the competition for a new church, Hetton-le-Hole, nine firms of architects sent in plans, and the decision of the committee has resulted in the selection of the designs of Mr. Stephen Piper, architect, of Newcastle-on-Tyne.

ARCHAEOLOGICAL SOCIETIES.

LONDON AND MIDDLESEX ARCHAEOLOGICAL SOCIETY.—An evening meeting of this Society was held on the 10th inst., at the London Institution, Finsbury Circus, when Mr. E. J. Barron, F.R.S., Vice-President, occupied the chair. Mr. J. H. Lloyd read a paper on "Portraits of some City Notables of the Stuart period." The paper was illustrated by a number of oil portraits, which Mr. Lloyd said had been collected or copied about sixty years ago by an artist of considerable reputation (whose name, unfortunately, did not transpire), but he considered it his mission in life to collect these portraits of leading men in the time of the Stuarts, and he thus collected no fewer than 160 of them. Of these, 120 were those of clergymen who were ejected by the Act



Accepted Design for St. Oswald's Church, Fulham. Messrs. A. J. Hopkins and W. V. Aspen, Architects.

of 1662. The artist required 5,000*l.* for the collection, but he died a disappointed man. Some time ago these oil paintings were announced for sale in the market-place, by a small dealer in the City of Exeter, when he (Mr. Lloyd) bought the entire collection, and thinking that the 120 clergymen, if they were hung at all, should be hung together, he presented them to the Mansfield College, Oxford. Those that he exhibited to the meeting that evening were portraits of men who had been connected, at one time or another, with the City of London. The collection included portraits of Oliver Cromwell (probably the last one painted of him); Sir Edward Coke; Sir John Elliot, Vice-Admiral of Devon, who was eventually imprisoned in the Tower, where he died in 1632; John Hampden; John Bradshaw (President of the Court which sentenced Charles I.); and William Kiffin, founder of the English Baptist denomination. Mr. Cecil T. Davis next exhibited and read a paper on "English Fire Insurance Tablets," a large number of which were shown on the walls and tables. The earliest mention of them, he said, was in 1680, when there was one representing a Phoenix, but the name of the office was then known as the "Fire Office." Signs were in those days used instead of numbers. The tablets were formerly placed on the fronts of houses that people might know who were insured. The firemen also were able to distinguish those insured, while each did his best to save the house which bore the mark or tablet of his office. The oldest tablets were made of lead, and those of later date were of copper and iron. Mr. Davis then described the various tablets exhibited and their distinctive features. Votes of thanks to the lecturers closed the proceedings.

ST. OSWALD'S CHURCH, FULHAM.

We illustrate the accepted design for this Church selected in a limited competition. Owing to the position of the site, the building is placed north and south. It will accommodate 750 persons. The materials will be red brick and stone, roof covered with green slates. The organ-chamber is carried as high as the plate of the chancel-roof, and has an additional opening at the level of the clearstory windows. The turret stairs lead to the bell-chamber, and also give access to heating-chamber, &c., beneath; the choir vestry is placed

beneath the sanctuary, with access from area steps as well as from clergy vestry.

The joint authors of the design are Messrs. Alfred J. Hopkins and W. Valentyn Aspen, the former of whom will superintend the erection of the building. The perspective was drawn by Mr. C. W. English.

Illustrations.

MARBLE SCREEN, S. LORENZO, ROME.

THE screen is fixed at the east end of the church, which was the entrance of the original early Christian building, but reversed in the thirteenth century by Honorius III., who added the nave and raised the floor of the east end as at present, by half burying the old columns. This seems the time when the screen and throne were erected behind the high altar, and corresponds with the time of the Cosmati family, who have given their name to this class of mosaic.

The throne is raised five steps above the floor of the apse, in front of the tomb of Pope Pius IX. The whole is of white marble, with delicate mouldings and carving, and is an excellent example of the Cosmati work, being inlaid with glass mosaic and panels of porphyry, green serpentine, &c. There is a great deal of gold in the mosaic, which by age has, in many places, lost its lustre and gained many dull tints of green and brown, adding to the colour-effect of the whole. The stars round the rectangular panels, which in the monotone reproduction appear lighter than the remainder, are all of this gilded glass. The coloured smalti are a rich red, a light and very dark blue, and some green. White cubes are also employed, but these are of marble, like the general work. The effect of the twisted columns, of which there are many examples of this period, is much emphasised by being richly inlaid with a great variety of patterns, and is very decorative and beautiful.

ALFRED H. HART.

MEASURED DRAWINGS OF NEWGATE.

THESE illustrations form a portion of a set of measured drawings by Mr. G. J. J. Lacy, for

which the first silver medal for measured drawings was awarded by the Royal Academy in 1893.

Some remarks on the history and architecture of Newgate Prison will be found in the third article in the present issue, p. 455.

PROPOSED HOUSE, POULTON, GLOUCESTERSHIRE.

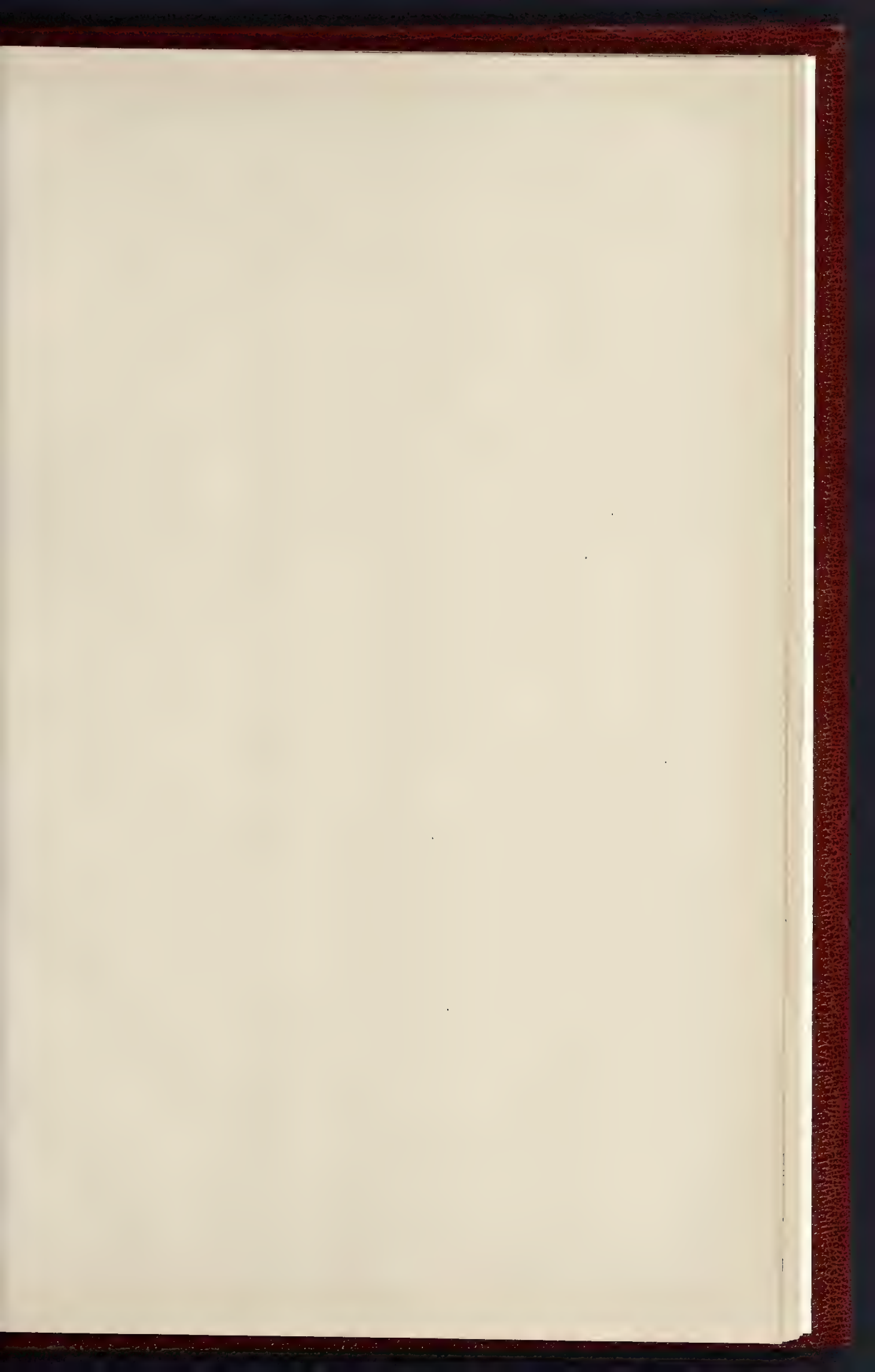
THIS house was designed for Mr. James Joicey, and intended to be built at Poulton, near Fairfield, Gloucestershire, in the local stone, on a level site standing rather high, from which the land slopes to the south-west. It is planned for future extension, it being proposed to add a large drawing-room in the south-west corner, with additional bedrooms over it. The Hall was to be carried up to the level of the bedroom corridor, and is the only portion of the house intended to be treated with any elaboration of detail or decoration, the rest of the work being perfectly simple. The kitchen, servants' hall, scullery, &c., are placed on the north side of the house; the first-named being lighted by a large skylight in addition to the window on the west side. There are no rooms over the kitchen, scullery, or dairy. There are five bedrooms (one for servants), a dining-room, bathroom, &c., on the first floor. Other servants' rooms are placed in the attic story in the west wing; while a bedroom for men-servants is placed over the hall (i.e., in the square tower). I proposed to cover the roof with the stone slates common to that part of the country.

CHARLES J. BLOMFIELD.

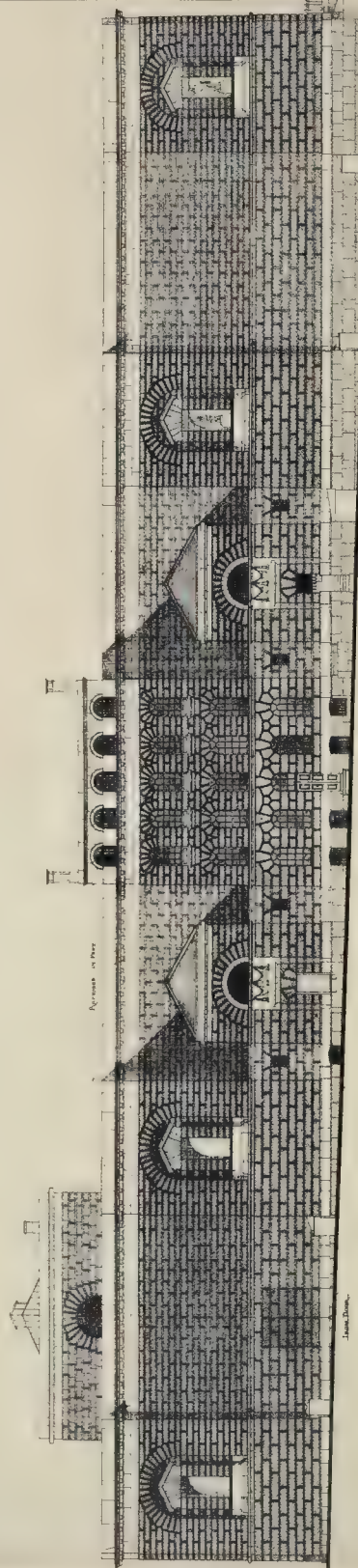
STOREY'S GATE, S.W.

THIS fine site, which is approached from Princes-street and Old Queen-street, Westminster, and abuts on St. James's Park, is exceptional in having entrances available for carriage approach in a Royal park. The lease was acquired by Major J. A. S. Cuninghame, of the Household Brigade, and a syndicate of his friends were about to erect residential suites of the highest class. Our illustration, the original of which was hung in this year's Royal Academy, shows the intended facade to St. James's Park, and is an instance of construction to the maximum height allowed, and to meet other provisions, under the London Building Act, 1894.

The architect has endeavoured to give the



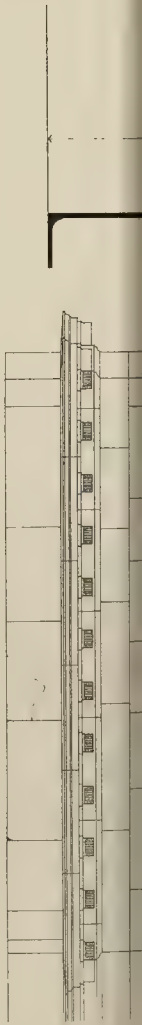
THE BUILDER, DECEMBER 21, 1895.

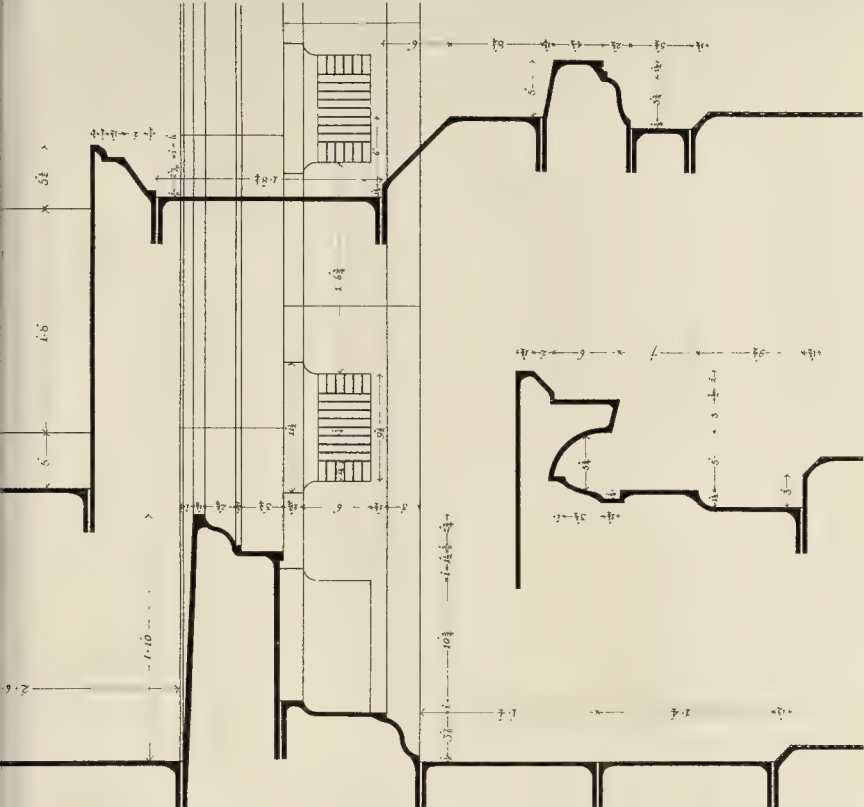
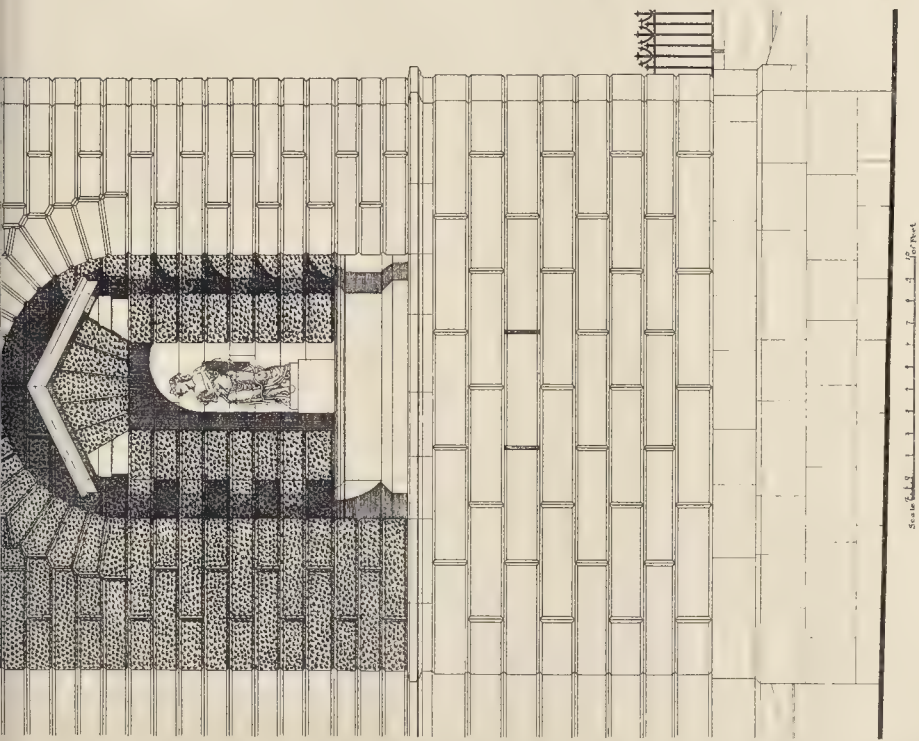


ELEVATION OF THE PRINCIPAL FRONT.

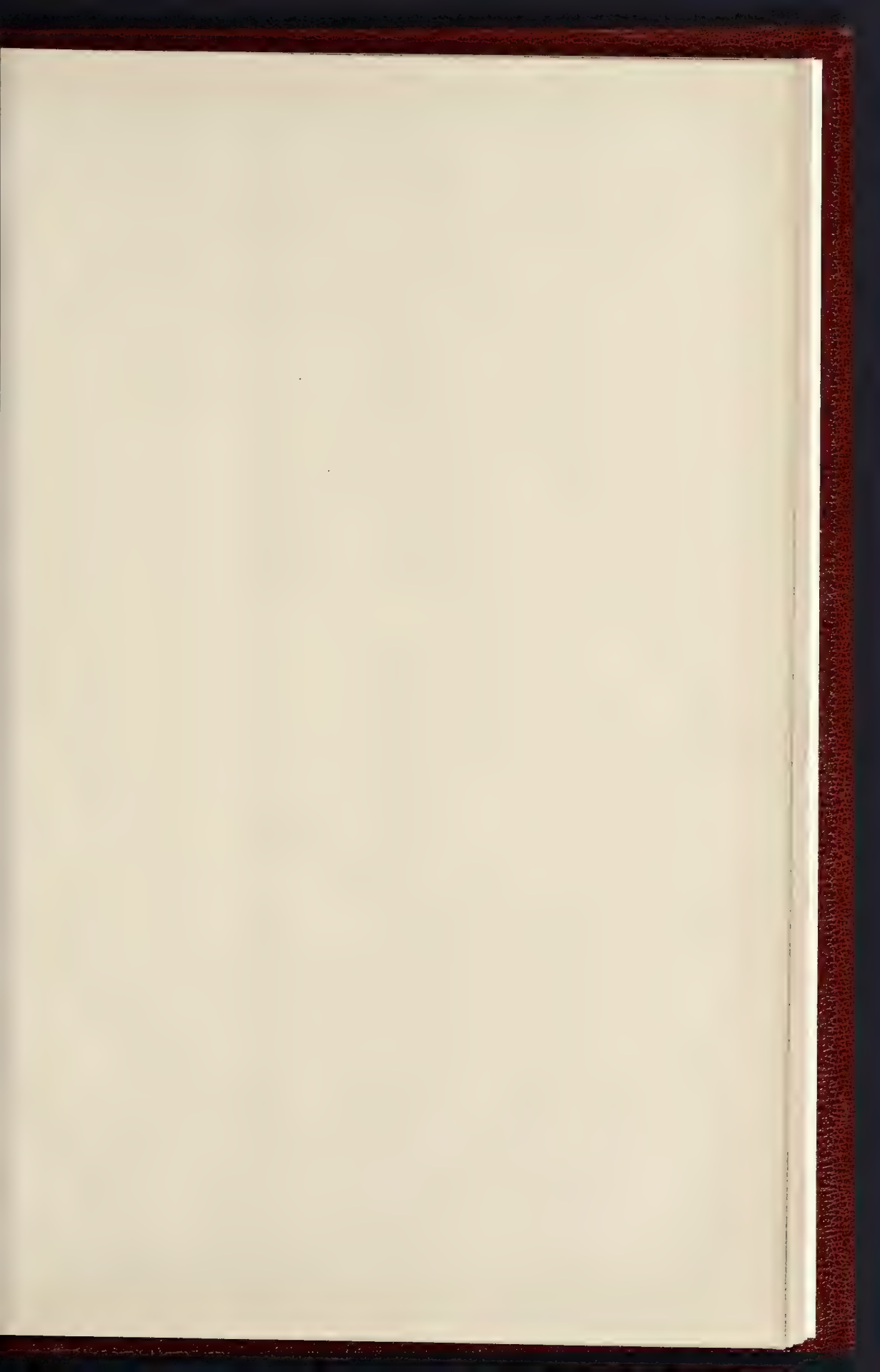
Scale 1 inch = 10 feet

PLAN SHOWING THE BREAKS IN THE FRONT AT FOOT.





ELEVATION AND DETAILS OF NEWGATE PRISON.—MEASURED AND DRAWN BY MR. G. J. LACY



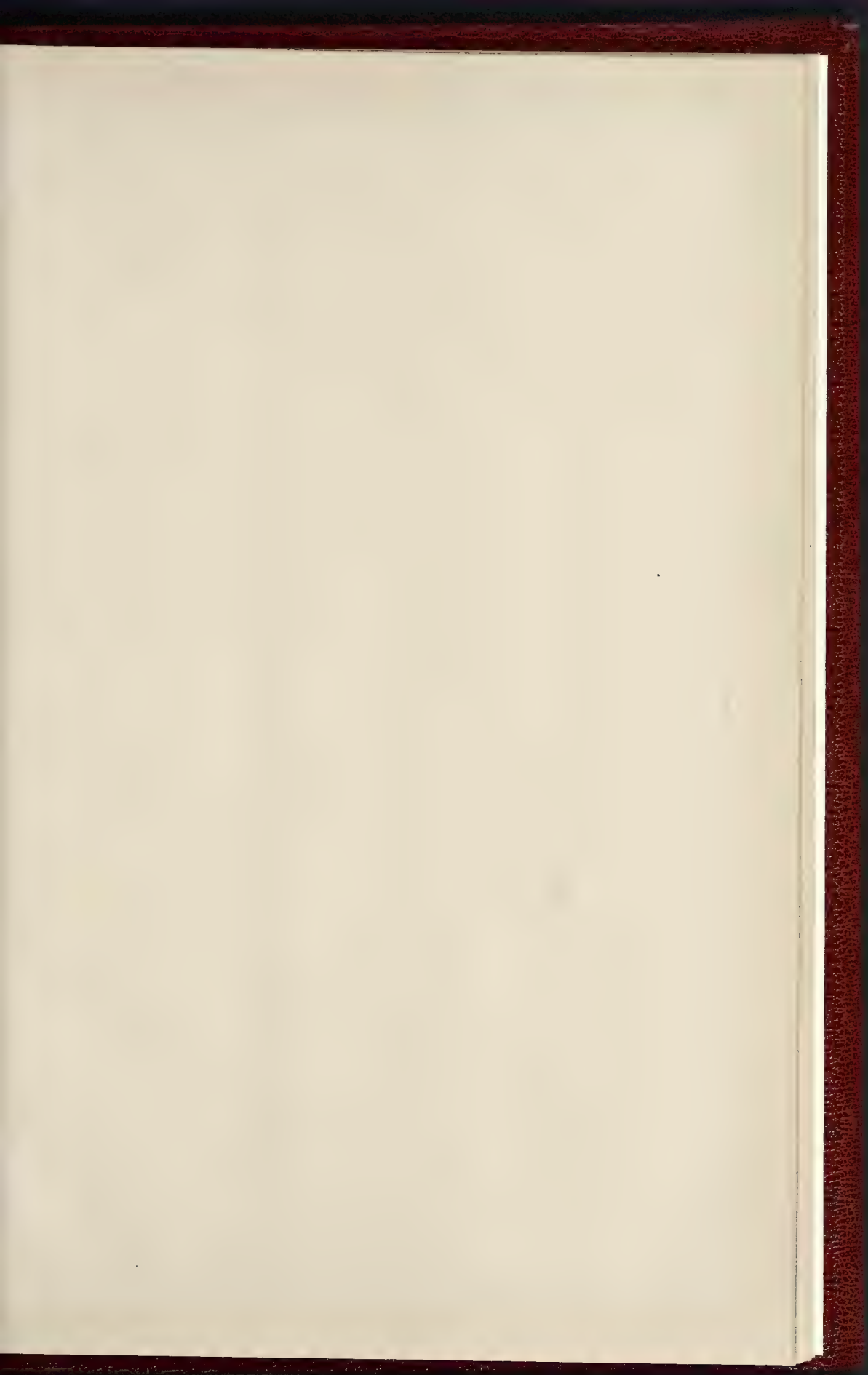
THE BUILDER, DECEMBER 21, 1895.

ROME

MARBLE SCREEN AND THRONE IN S. LORENZO



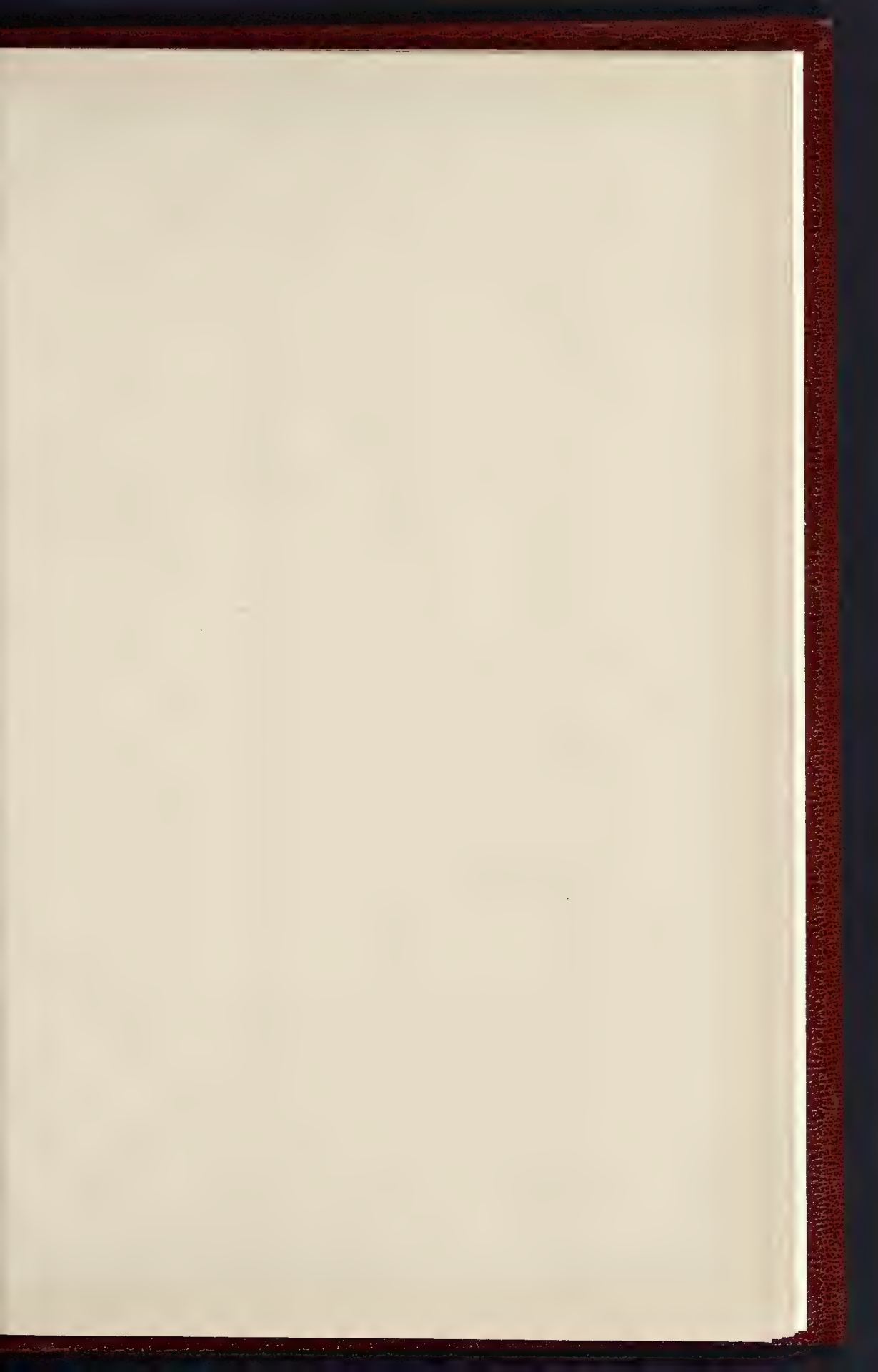








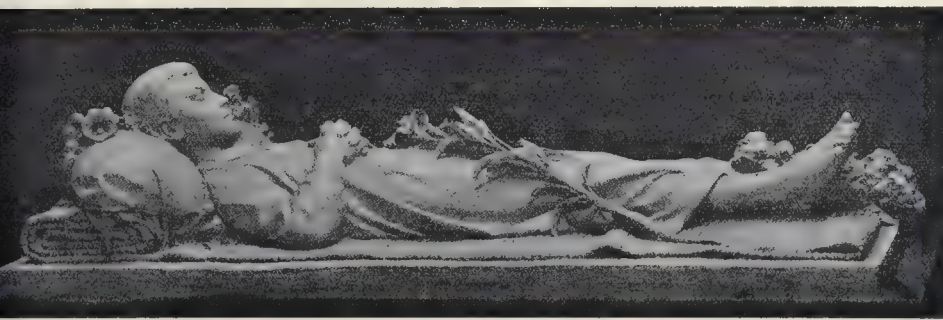
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PROPOSED NEW MANSIONS. STOREY'S GATE: FROM THE SOUTH.





Reclining Figure for the Harvey Memorial, Harberton Churchyard

ing an appearance of solidity suggested by character of adjacent architectural surround- such as the Foreign Offices, the Horse Guards, and the new Admiralty Offices, so far as consistent with the requirements of family *en suite*. The entire plinth is to be in one white Portland ashlar, and the rest of one dressings in Douling stone from Mallet, Somersetshire, relieved by red brick facings. The roof, which will be constructed of rolled steel and concrete at a pitch of 75 deg., with a flat on the top, will be covered with green Westmoreland slate. The elevation will not be carried out as illustrated, various alterations being suggested in consequence of negotiations for large lettings; for which reason the plan at present being given, as it is in process of completion. In one such case the result has been the acquisition of the eastern half of the site by the Institution of Mechanical Engineers for the erection of a new Institution house, which is of the same height but more Classic in style, while harmonising in design with the order of the block. This work has been referred to the superintendence of the same architect. Bills of quantities are being prepared by Messrs. Dunk & Bousfield, surveyors, of Billiter-square, buildings, E.C., and a contract for the structure will be entered into early in the next year. The excavating and foundations are now being carried out by Mr. N. Fortescue, of Eckeney; the clerk of works being Mr. W. W. Ringham. Mr. Basil A. Slade is the architect.

FIGURE FOR THE HARVEY MEMORIAL, HARBERTON.

The reclining figure illustrated is a life-sized statue carved in statuary marble, and will stand on the top of the solid marble sarcophagus in front of the Harvey Mausoleum, which, also entirely of marble, has just been erected in the graveyard of St. Andrew's Parish Church at Harberton, in South Devon. The chapel, which measures 12 ft. by 12 ft., and is sunk 6 ft. into the ground. The chamber is approached from the north by a flight of eight steps of grey granite. The entrance doorway has a pair of double doors of massive gun-metal, and these are surmounted by an arch, and motto of family. Within, the floor, walls, and roof are all built up, but are each of thick slabs cut from unusually large blocks of marble. Projecting from the wall at the head of the figure is a shelf of polished and polished alabaster. The inscription in inlaid metallic characters, at the foot of the marble casket, runs:—

ROBERT GODEFROY (TITO)
ELDEST SON OF ROBERT
AND ALIDA MARIA HARVEY
BORN AT IQUIQUE PERU
13 AUGUST 1884
DIED AT FORTHILL SCHOOL
EAST GRINSTEAD
21 MAY 1895

above the ground the structure has continuous ground around it to the height of about 4 ft. The top of this is a large Calvary Cross, per- plain. Standing as it does on the brow of the ground, this cross is seen in outline with effect from several distant points of view.

The chapel, which is quite complete, has been erected under the superintendence of Mr. Tollit, of Totnes, architect to the Dundridge Estate. The reclining figure will probably be *in situ* by Christmas. All the work is being carried out by Messrs. Harry Hems & Sons, of Exeter.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday, at the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Thames Steamboat Service.—The Rivers Committee reported as follows:—

"In accordance with the instructions of the Council we are considering the question of the best means of restoring to the Thames its old service as a highway. To enable us to advise the Council on the subject it is necessary to obtain certain information, particularly in reference to the street approaches to the river and piers. We therefore recommend that, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Engineer be authorised to engage the services of three temporary assistants for a period of four months, at weekly salaries not exceeding 4*l.* 4*s.* each."

Mr. E. White moved and Mr. Corbett seconded to refer the Report back to the Committee, in order that they might more fully disclose their object and intentions.

On a division the amendment was rejected by 62 to 46, and the Committee's recommendation was agreed to.

The Purchase of Tramways.—The Highways Committee recommended—

"That, inasmuch as the Highways Committee is at present disabled from negotiating with tramway companies, in consequence of the resolution of the Council of December 4, 1894, which limits the length of leases to be granted of undertakings purchased by the Council, the Committee be empowered to consider, without prejudice to that resolution, any proposals that may be made by the companies, and to submit recommendations thereon to the Council."

Mr. Beachcroft moved to omit the words "by the companies," at the end of the recommendations, so that any proposals, by whomsoever made, might be considered. This was agreed to.

The statutory resolutions were agreed to, directing the service of a notice upon the London Street Tramways Company for the purchase by the Council under the provisions of section 43 of the Tramways Act, 1870, the tramways and works and undertakings authorised by the company's Act of 1874, as altered and amended by the company's Acts of 1884, 1885, and 1887.

London Water-supply.—Mr. H. P. Harris brought up the report of the Parliamentary Committee, which contained the following recommendations:—

"(1) That Her Majesty's Government be invited (a) To constitute by Act of Parliament, a public authority for the water area defined below; (b) To vest in such authority when constituted the powers now exercised by the metropolitan authorities under the Metropolitan Water Acts in reference to the water companies, and certain of the powers now possessed by the Local Government Board with a view to improved administration and efficient control; (c) To confer upon such authority power to negotiate

for the purchase of the respective undertakings of the water companies, and to give effect to such purchase in such manner as may be found expedient, and if thought fit to seek Parliamentary powers for the acquisition of the undertakings otherwise than by agreement, and for dealing with the whole question, including that of future supply.

(2) That pending the constitution of such authority, the Council do authorise negotiations to be initiated by the Parliamentary Committee with the water companies for the purchase of their undertakings.

(3) That with a view to the Council coming to a decision on the pressing question of new sources of supply as compared with a scheme of storage reservoirs, the Water Committee be instructed to report their final conclusions without delay."

The Committee suggested that the proposed public authority should be composed of members nominated by the Council, the City Corporation, and the Home Counties, with the addition of nominees of the Local Government Board, and of a sufficient number of co-opted members possessing special knowledge and qualifications. No doubt, they added, special provision would have to be made in any case, for such authorities as Croydon, Richmond, and Tottenham. The Committee's definition of the water area was—the City and Metropolitan Police District, covering 701 square miles, and outlying districts, embracing about 144 square miles.

Mr. McKinnon Wood, on recommendation (1), moved the following amendment:—

"That Her Majesty's Government be asked whether they will promote or assist legislation dealing with the Metropolitan Water Supply on the following lines:—That the entire control of the water supply within the area of the County of London shall be in the hands of the London Council, directly represented by the County Council in conjunction with the City Corporation; that the consumers in the metropolitan water area outside the county shall not be denied or deprived of similar rights in their respective areas; and that the purchase price of the existing water undertakings shall not be assessed under the provisions of the Lands Clauses Consolidation Act, but shall be based upon the fair and reasonable value of those undertakings, due regard being had to the rights, special circumstances, and obligations of the companies; also that the Parliamentary Committee be instructed to report as to the reply of Her Majesty's Government immediately after the recess."

Mr. E. Spicer seconded the amendment, which, on a division, was agreed to, fifty-six voting for and forty-nine against. On the question that the amendment be the substantive motion there was another division, which resulted as follows, for, fifty-six; against, forty-three.

Mr. Stuart moved, and Dr. Collins seconded, to amend recommendation (2) by omitting the words "pending the constitution of such authority," and substituting "Water Committee" for "Parliamentary Committee."

The amendment was then adopted and the recommendation, as altered, was approved. Recommendation (3) was also adopted.

Fire Brigade Work.—On the recommendation of the Fire Brigade Committee it was agreed to sanction the execution by the Works Committee of the further work required at the Camberwell station.

By-laws, London County Council (Subways) Act, 1893.—The Highways Committee reported

that the Board of Trade had approved of the by-laws under the London County Council (Subways) Act, 1893.

Horseless Vehicles.—The same Committee recommended that the Parliamentary Committee be requested to ask the Government to reintroduce the Bill of the late Government for removing the existing restrictions on the use of mechanically propelled vehicles under two tons in weight. The recommendation was adopted.

Widening of Fulham-road.—On the recommendation of the Improvements Committee it was agreed to contribute on the usual conditions one-half of the net cost of the improvement proposed to be carried out by the Vestry of Fulham in the Fulham-road, between the free library and Wheatheaf-alley, such contribution not to exceed the sum of 1,157*l*.

Gallery of Illustration.—The report of the Theatre and Music Halls Committee contained the following paragraph, the recommendations being agreed upon:—

"We have considered four drawings, dated September 12, 1895, showing certain alterations it is proposed to make at No. 14, Regent-street. The premises will be known as the Gallery of Illustration, and the hall, which is on the first floor over the show rooms of the Pneumatic Tyre Company, will accommodate about 350 persons, and will have a stage at the east end separated from the hall by a proscenium-wall. The proscenium opening will be fitted with a fire-proof curtain. On the second and third floors, over the saloon, cases and offices, are living rooms or flats with a separate exit-staircase. It is not intended to use the premises for stage-plays, and the drawings technically comply with the Council's regulations in regard to places to be used for concerts, &c., but as we greatly object to living-rooms and commercial premises being connected with a place of public entertainment, we are of opinion that the Council should exercise the powers provided by Section 12 of the Metropolis Management and Building Acts Amendment Act, 1878, and attach conditions to the approval of such drawings to the effect that no factory, workshops, or repository shall be allowed underneath the hall, and that no dwelling-rooms shall be attached to the premises. We therefore recommend:—

"That the four drawings, dated September 12, 1895, be approved, upon the following conditions:—(a) That no factory, workshops, or repository be allowed underneath the hall; (b) That no dwelling-rooms be attached to the premises; (c) That iron doors be fitted to the openings between the stage and the dressing-rooms; (d) That the windows be removed from the dressing-room staircase. That the owner be informed that the works must be commenced within six months, and that the premises must be completed in all respects in accordance with the regulations of the Council, and the above conditions and the provisions of the London Building Act, 1894; that upon our reporting the completion of the building a certificate under the Metropolis Management and Building Acts Amendment Act, 1878, be sealed and issued to the owner of the premises, but that he be informed that the issue of such certificate will not preclude the Council from considering on its merits any application which may hereafter be made to it with respect to the licensing of the building for public entertainments."

The Council adjourned for the Christmas recess at half-past 8 o'clock.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—The fifth general meeting of the current session of this Association was held on the 13th inst., when Mr. J. A. Gotch gave a most interesting account of the Renaissance in England, illustrating his remarks by numerous lantern slides.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—A lecture was delivered in the rooms of this Association on Tuesday by Mr. James A. Morris, Ayr, on "Architecture: What is it?" The President, Mr. A. N. Paterson, M.A., was in the chair. Reference was made by the Chairman to the loss the Association had sustained in the death of Mr. Thomas Gildard, Hon. Member and Past Hon. President of the Association. Mr. Morris then read his paper, the main object of which was to urge that architecture was not merely the art of building and construction, any more than poetry was the art of grammar; that it was essentially a fine art, and not an occupation to be pursued as a business. A large number of lantern slides were shown in illustration of the lecture, which was considered to have been one of the best papers ever read before the Society. We may be able to give some of this paper on a future occasion.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION AND CAMERA CLUB.—A combined meeting of these two bodies was held at the Rooms of the Association on Wednesday, Mr. Herbert A. Satchell in the chair. The paper was by Mr. E. W. M. Wonnacott, and dealt with the history of "Holland House." The author began his account by giving the local reference in Domesday

Book, and described the growth of the buildings from the erection of the centre block and turrets (Cope Castle) in 1607 down to the recent additions by Col. Edis), mentioning, by the way, many of the notable personages with whose lives the house has been associated. The paper was illustrated by a series of 100 lantern views lent by Mr. Dixon; several drawings lent by Col. Edis, and some good photographs. Mr. Bertram N. Southall proposed, and Mr. W. Bonner Hopkins seconded; a vote of thanks to the author. Messrs. Garbutt and Brodie followed, and the Chairman then put the vote of thanks. The author having replied, the meeting terminated.

ENGINEERING SOCIETIES.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—The opening meeting of the session of the Civil and Mechanical Engineers' Society was held on the 12th inst. at "The Ship" Restaurant, Charing Cross, under the presidency of Mr. Sydney A. Court, A.M.Inst.C.E., who delivered his inaugural address as President, and took for his subject "Civil Engineering." After briefly reviewing the development of the science, he dilated more particularly on the necessity of those professing to be civil engineers being properly qualified, and strongly objected to any man who chose being allowed to call himself a "civil engineer." He was of opinion that if Parliament thought it necessary that a dentist should have a proper qualification for pulling out or stopping a tooth, that it was still more necessary that an engineer, on whose skill and ability the lives of many depended, should have proper qualifications, and that those who had not should be prevented from advertising themselves and making use of the name of the profession of those who had. Mr. A. Court was also of opinion that the civil engineer should have a good general and theoretical, as well as practical education, enabling him to deal in a sound way with the matters that come before him, just as a properly-qualified medical man does with the cases that he has to deal with: he also alluded to the advantages of some men becoming specialists in certain branches of the profession, as in the medical and surgical professions. He pointed out the advisability of employing the civil engineer in all large buildings; he drew a distinction between the manufacturing engineer and the consulting engineer, and alluded to the advisability of those constructing works and inhabited buildings employing the consulting engineer and not trusting to the cheapest contractor for supplying, unchecked, the large amount of mechanical apparatus and devices connected with drainage, water supply, heating, lighting and the ventilation of all inhabited structures. A discussion of a most interesting character ensued, and was taken part in by the Past-President, Mr. C. T. Walrand, the Honorary Secretary, E. H. G. Brewster, and Messrs. R. Booth, H. Coward, William C. Street, W. M. Binny, and others.

Correspondence.

To the Editor of THE BUILDER.

SHOREDITCH BATHS AND LIBRARY COMPETITION.

SIR,—We are very glad to see your protest against the conditions of this competition, and the amount of work asked for from competitors.

We wrote a letter at an early stage of the competition pointing out that the 3-in. details asked for were not necessary in order to help an assessor to arrive at a decision, and that if it were necessary to require each competitor to send in a plan showing engineering details, the perspective might be omitted to somewhat reduce the immense labour of the competition.

The answer we obtained was that the matter had been considered by the Commissioners and assessors, and that it had been decided to retain them "in the interests of competitors!"

Now, as to the County Council requirements, if the large bath is used as a hall, the competitors were told in "replies to queries," that the London County Council might not require "strict conformity" with their regulations, but that competitors would have to guarantee that their designs would be passed by the Council, and "enquiries had better be made to ensure that this will be the case."

Now, Sir, we think everyone is aware how difficult it is to obtain definite information from an official department to meet a supposititious case. We tried to do so, but only received the reply that it would be wise to adhere to the regulations laid down, which we did, to the detriment of our design. All this would have been easily avoided if the instructions had contained a sketch-plan showing a few

positions of the large hall, which would satisfy these modified requirements, and the Baths Commissioners and their assessor could have obtained this information with ease.

In the reply to the fourth query it is stated that the "ancient lights in adjoining streets must not be interfered with." Now, as the existing buildings on the site had for the most part been cleared, we wrote enquiring how high the buildings which faced Bowling Green Walk (which is 18 ft. 9 in. wide) had been, and we received a reply that "probably the vestry might know"; and later a reply was sent which we enclose. No circular was ever sent round to us as promised!

The absurdity of calling on competitors to set back for ancient lights, when no information is given as to essential conditions which govern such cases, is too ridiculous to be insisted on. And what could be easier than to note all round the site-plan—"here, buildings must not exceed — feet in height."

But the length of the instructions is quite out of proportion to the amount of useful information contained in them.

We certainly shall always make a point of protesting against all conditions which ask for more than one-eighth scale drawings, with or without perspective, or one-sixteenth scale drawings, in which case it may sometimes be necessary to ask for a detail; and we hope others will do the same, as it is only by such protests that conditions such as those for Shoreditch will become a thing of the past.

HANNAFORD AND WILLS.

Swansea, December 16, 1895.

HOME, SUITE HOME! OR, FLATS IN PARIS.

SIR,—The Paris edition of the *New York Herald* publishes, December 9, an article on what it calls "Radical Transformation in Paris Life: Flats Preferred to Separate Houses." The headlines are misleading, as Parisians, except the very wealthiest of them, who occupy their *hôtels*, have lived in layers, one above the other, from time immemorial. What the *Herald* means to say is that these *hôtels* are being given up for what it calls "apartment-houses." This it states on the authority of Mr. Sprent, a Parisian house-agent, whom it has interviewed.

Mr. Sprent attributes the new departure to the influence of English and American families settled in Paris. These, by insisting on "*le confortable*," have got it, and their apartment-houses, full of modern improvements, have, he says, caused the *hôtels* built even so recently as ten years ago to be out of date now. He gives particulars of the rents of the new flats, which may interest Londoners. They seem high, but he thinks they may go down, even although ground-rents may go up.

"Will the rents of these modern flats go higher still, Mr. Sprent?"

"I don't think so. In fact, I believe the utmost limit has been reached, and some people fancy it has been exceeded and that a general reduction will follow. During the last twenty years the rent of apartments in the fashionable quarters of Paris has nearly doubled. However, that is due almost entirely to the fact that the value of the ground has so considerably increased. Speaking of the rise in the value of land, I can warrant that every ten years there is an increase. It is regular as clockwork; there is a sort of stagnation period of a decade, and then up go prices. There is no doubt of that."

"Land in the fashionable quarters sells," says Mr. Sprent, "at about 8*l*. per foot superficial in the Avenue des Champs Elysées, and at about 4*l*. in the Avenue du Bois de Boulogne. In the unfashionable quarters it may have fallen or stood still in value."

The *Herald* gives a plan of one floor of No. 82, Avenue des Champs Elysées, a four-storied block, which the house-agent considers to be the finest apartment-house in Paris:—

"Each apartment in this house comprises an antechamber and *galerie*, two salons, billiard-room, eight bedrooms, six cabinets de toilette, bathroom, five water-closets, dining-room, office de salle-a-manger, servants' hall, kitchen, wash-room, linen rooms, servants' rooms, cellars and stables and coachhouse. Each apartment has gas and electric light, hot and cold water, steam-heating apparatus, lifts, electric bells, telephone, and dumb-waiters."

The entire block has been let to tenants of apparently the most substantial sort. The gross rent obtained is 4,900*l*. per annum, being, for the ground floor, 1,200*l*.; first floor 1,500*l*.; second floor, 1,200*l*.; third floor, 600*l*.; stables 120*l*. The names of the tenants are given.

The *Herald* also gives a plan and perspective sketch of another house, No. 104 in the same avenue. This is a corner site, and has the cupola which seems to be *de rigueur* for recent Parisian apartment-houses. The plan shows a suite of rooms on each floor. The corner suites commanding the Champs Elysées are the dearest, next those at the side, and then some with a much inferior aspect, towards Washington street. There are six floors, and the rents asked average 1,000*l*. per annum for the corner suites, and about 800*l*. and 300*l*. respectively for the others. The gross rental of this block, if the prices asked are obtainable, will approach 13,000*l*. per annum.

If American newspapers were given to the practice of "booming" enterprises of this sort one might, but no, do not let me be so ungracious as to suggest

that either the owners of No. 104 or the energetic house agent "got at" your contemporary; a thing which everybody knows to be impossible.

L. C. R.

The Student's Column.

METALS USED IN BUILDING.

XXIV. AND XXV.

STRENGTH (continued).

F the various kinds of copper it is generally recognised that their tenacity is least when in the form of castings. Thus, according to American experimenters, the tenacity in tons per square inch of ordinary cast copper ranges from about 6 to 10; whilst Anderson found it to vary from 8½ to 11½. The tenacity of forged copper is materially increased by the addition of minute proportions of phosphorus to the metal. Forged copper in the ordinary state has a tenacity of about 13 to 16 tons per square inch, but with .04 per cent. of phosphorus the tenacity rises to over 22 tons, and the strength is, practically, proportionate up to that amount. A very high result is obtained by hard copper wire, viz.—26 tons per square inch.

In regard to the strength of tin, that metal being chiefly used in alloys no particular attention has been paid to it separately. But Thurston gives its tenacity as ranging from 0.89 to 2.68 tons per square inch, and its coefficient of elasticity as reaching .5, 125. The same author gives the tenacity of cast bars of zinc as 2.0 to 2.9 tons per square inch; though Professor Unwin found only a tenacity of 1.1 to 1.5 tons. Sheet zinc is credited with having a tenacity of 7.14 tons per square inch. From the foregoing it will be noticed that copper has a much higher tenacity than either tin or zinc, and that of the two latter zinc is decidedly the stronger.

The behaviour of alloys of these metals, in regard to strength and other physical properties, is by no means governed by the relative proportions of the metals in the alloys. Or, rather, one could not arrive, theoretically, at the strength of an alloy from a consideration of the strength of its component metals. This will be readily understood from what has been said concerning the peculiar methods of union of these metals in alloys. Obviously, a great deal depends on the judicious manner, or otherwise, in which the alloy has been prepared with a view to the thorough union of the metals, and that without prejudice as to whether such union leads to true chemical alliance or merely a mechanical admixture.

The alloy known as steel-bronze has been carefully investigated in view of its general employment in the arts. The name is very misleading, seeing that steel-bronze has no iron in it, but merely refers to cast bronze which has obtained its utmost strength of resistance, equal to unchilled steel, by being subjected to a tension beyond the limit of its elasticity. If bronze containing from 6 to 8 per cent. of tin be cast in the usual way in thin pieces, when cool it will be tolerably homogeneous in all its parts; but if the castings be made thicker, the parts which come in contact with the mould will be found, on examination, to contain less tin, on account of the rapid decrease of temperature, and by crystallisation, to have forced the particles richer in tin before them, and produced, in combination with the more gradual process of cooling, a mixture of bronze with free particles of tin entirely wanting in the homogeneity on which the application of this metal to higher purposes principally depends. Two methods have been adopted to remedy this evil: one consists in subjecting the bronze, whilst in the molten state, to heavy pressure, until the metal is cold; in the other the molten bronze is run into a thick cast-iron mould and cooled very rapidly. It is stated that the quality of the metal produced by either of these means is about the same.

Yet the two processes are the reverse of each other, and it is difficult to understand that homogeneity results in either case. We know well enough that the application of pressure to a molten mass retards its cooling, but that is generally accompanied by partial crystallisation on a different plan to what would take place were it allowed to cool in the ordinary way. If very great pressure were applied it is conceivable that the molten mass would develop porphyritic structure on a small scale, and the crystals would assume a tabular rather than an acicular habit— to the immense improvement of the compressive strength of the metal when cold. On the other hand, when, as in the second process adverted to, the molten mass cools very rapidly, one

would not suspect that that could be accompanied by a corresponding increase in strength, unless, indeed, steel-bronze is a peculiar exception to the rule. Rapid cooling generally means a want of thorough crystallisation, and in the vast majority of cases investigated, seeing that the surface of a large mass of molten material must cool quicker than at some depth within the mass, the class of crystallisation (if present at all, in the true sense of that term) developed on the surfaces open to the air must of necessity be different to that developed in the interior of the mass. It is inconceivable that such a mass could be really homogeneous, from a consideration of the most elementary laws in physics. Although the effective resistance to strain might by experiment be found to be somewhat similar, such result could not, we conceive, be due to the property of homogeneity, but rather to the inherent qualities of the alloy along two distinct lines of descent from the ordinary state of the metal.

In any event, from a commercial standpoint, the production of what is usually called a homogeneous mass (as seen by the naked eye) is the first improvement in bronze, and the first step towards steel-bronze. The second is straining the chilled bronze beyond the limit of its elasticity, because this metal does not obtain its "steel" properties in respect of strength, elasticity and hardness until it has been strained beyond this point. The following table compiled from the researches of General Uchatius by Herr Paulus* is interesting as giving the strength and other physical properties of various kinds of commercial bronzes.

Table showing the physical properties of different kinds of Bronze.

Alloy.	Per cent.	Tons per sq. in.	Limit of elasticity.	Elastic extension in 100 ft.	Permanent extension in per cent. of length.
Bronze containing 10 tin	32.128	10.794	174	1.5	
" " 8 " "	33.017	8.889	140	2.5	
" " 6 " "	34.668	8.254	128	3.5	
" " 4 " "	37.175	3.810	89	0.5	
Bronze containing 10 tin and 1 zinc.	26.477	6.140	110	0.7	
Bronze containing 31 tin and 1 zinc.	24.128	9.584	157	1.7	

Herr Paulus suggests that not only bronze, but wrought-iron, steel, and doubtless all ductile metals, if stretched beyond the limit of their elasticity, would really attain a far greater limit. Thus, that of elasticity of chilled but unstretched bronze was reached with 2.54 tons per square in., the elastic tension being 0.004 of its length; whereas after the rod had been strained until its permanent extension was 0.004 of its length, its limit of elasticity was raised to 10.159 tons per square in. (i.e., fourfold), and its elastic extension became 0.00192 of its length.

Many experiments to ascertain the strength of phosphor-bronze have been carried out. Speaking generally it may be said that that alloy possesses the advantage of not becoming crystalline under the action of repeated shocks and bends, and is, amongst other things, well adapted for wire rope. Clark's tables give the following values for phosphor-bronze wire. For annealed wire about 0.6 in. in diameter, the lowest tenacity is 43½, highest 71½, and mean 56.3 tons per square inch; for annealed wire of the same character, but about 0.11 in. in diameter, the lowest tenacity is given as 22½, highest 28½, and mean 24.4 tons per square inch. Austrian experiments on phosphor-bronze bars gave the resistance at the point of elasticity as 19,857 lbs. per square inch, and the resistance at the point of rupture as 58,383 lbs. per square inch. Another series of experiments, made by General Uchatius, yielded 54,915 lbs. and 81,795 lbs. per square inch respectively.

The tensile strength of manganese-bronze, for rods rolled hot, varies from 29 to 39.60 tons per square inch; for plates rolled hot from 28.46 to 30.78 tons per square inch; and for the metal as cast under pressure, from 31.90 to 35 tons per square inch. The disparity of the results in some of the cases is due to the particular condition under which the metal, as tested, existed—according to whether it was annealed or delivered to the testing machine direct from the rolls; or whether it was pulled across or with the fibre.

Mr. P. M. Parsons has shown* the strength of certain varieties of manganese-bronze, by torsion, as follows:—

Manganese-Bronze—Torsion Tests.

Description of metal.	Diameter, inches.	Twisting moments in inch pounds.		Amount of twist in diameter, number of turns.	Remarks.
		Elongation.	Twisting stress.		
1. Cast under pressure.	0.622	1,171	3,360	0.181	Uniform twist.
2. Cast under pressure.	0.622	1,100	3,372	0.146	"
3. Rolled.	0.621	1,110	2,560	0.172	Annealed.
4. Rod.	0.611	1.58	3,242	0.10	Rolls hot tested direct from rolls.

No. 3 was removed from the machine unbroken.

The transverse strength of manganese-bronze as ascertained by the same author on a bar of the metal 1 in. square cast in sand, and placed on supports 12 in. apart, steady pressure being applied in the middle of the bar, was as follows:—With a deflection of .025 in. the stress was found to be 896 lbs., when the bar had arrived at a deflection of .06 in. it stood at 1,792 lbs., at .21 in. 2,688 lbs., at 1.97 in. 4,144 lbs., and when the stress had reached 4,256 lbs. the bar gave way, but without breaking, bending to a right-angle.

No better series of tests as to strength and allied physical properties of brass could be quoted than those made by Professor Thurston for the United States Testing Board about seventeen years since, and set out in detail in the first volume of the Report of that body (which the student should consult for further particulars). Knowing the multitude of metals that pass by the name of brass in the market, the composition of each sample tested was ascertained, so that the results should apply to substances of a specific nature, and so that the metallurgist, as well as the architect and engineer, should profit to the utmost, in the practical sense, from the elaborate investigations. In other respects, also, the tests made by the same accomplished experimenter are models of what such work should be:—

Strength, &c., of Brass.

Composition.	Density.	Coefficient of thermal expansion.	Coefficient of elasticity.	Tensile strength.	Longitudinal strain.
Cop. Zinc.					
82.5 17.5	8.41	10.35	6,440	14,55	26.7
75.0 25.0	8.41	9.46	5,507	12,56	1.4
70.0 30.0	8.41	9.7	5,085	13,82	0.6
60.0 40.0	8.41	10.52	4,141	11.1	2.2
50.0 50.0	8.41	12.70	3,175	10.85	7.7
40.0 60.0	8.41	17.40	5,411	18.14	20.7
30.0 70.0	8.41	16.55	4,213	16.77	11.3
20.0 80.0	8.41	14.91	5,167	11.54	5.9
10.0 90.0	8.41	11.1	6,261	10.78	0.8

Professor Unwin obtained† for ordinary brass used for machinery a tenacity of 10.43 to 11.62 tons per square inch, an extension of 13 to 22 per cent. in 8 inches, and a contraction of area of 16 to 27 per cent. The coefficient of elasticity is about 5,080 for rolled brass. The same author, experimenting with delta-metal, ascertained that its tenacity was approximately as follows:—For cast-brass, from 17.05 to 23.79 tons per square inch; for a rolled bar 33.26 tons; for a ring cast whilst rotating, hammered cold, 39.75 tons per square inch. These results, however, are shown of much practical value, as the actual composition of the metal is not quoted, and it is therefore impossible for anyone to know what kinds of delta-metal were employed in the tests. As the student already knows, delta-metal is, in general, an alloy of copper, zinc, iron, and phosphorus, introduced to each other by special methods; but in some cases, to impart certain properties to it, tin, manganese, or lead are also employed. With such a range of composition possible it is highly desirable to give a quantitative analysis or assay so that one may glean some idea of the class of delta-metal experimented with.

The strength of lead is a difficult matter to ascertain satisfactorily except for tension; its tenacity is usually quoted as about 1 ton per square inch. It is such a soft metal, and so ductile, that attempts at arriving at its compressive resistance (as in certain other metals and

* Organ für die Fortschritte des Eisenbahnwesens, Vol. xiii, p. 140.

† "Trans. Cleveland Inst. of Engineers," Dec., 1888, also in Horn's "Mixed Metals," 1890, p. 209.
‡ "The Testing of Materials of Construction," 1888 p. 344.

many alloys) have usually ended in elaborate calculations as to the weight required to make it "flow," or to bulge in the centre when cylinders of lead are tested. In connexion with the last-mentioned property the experiments of Professor Kick* may be quoted. The results refer to a homogeneous lead cylinder the original height of which was 64.4 mm. and the diameter 50.05 mm. :—

Experiments with Lead Cylinders.

Experiment No.	Height in Millimetres.	Diameter in Millimetres.		Pressure in tons.
		Top & bottom.	Centre.	
1....	57.3	51	54	2.90
2....	47.6	53	60	3.25
3....	42.3	55	61	3.35
4....	40.9	56	65	3.45
5....	34.4	62	71	3.95
6....	28.2	69	79	5.65

As the outcome of these experiments the author made the important practical discovery that in a soft body, if the material can change its shape under pressure, its density will not be affected. Thus, with a very homogeneous cylinder of lead, the density, both before and after pressure, was 11.35, though the cylinder was reduced, during the process, to half its original height. It was found, also, that the density was but slightly increased by a sudden blow. A piece of pure lead was tried under a steam-hammer of 2½ tons, with a fall of 19 inches; the change in density was only from 11.354 to 11.376. The further result of the experiment was, that the shorter the time under pressure, the less was the deformation; and the more violent the blow the less the effect. The density above quoted, although said to refer to pure lead, is somewhat lower than the accepted density of the metal (namely 11.45), and is thus liable to the suspicion of not being quite pure. All base metals alloyed with lead lower its density. The coefficient of expansion of lead is commonly stated to be .0003 for each degree between 0 deg. and 100 deg. Cent.

THE great interest taken in recent years in aluminium has led to a fairly exhaustive series of testing experiments as to its various qualities, but none have received greater attention than the property of strength. As might be readily anticipated, these experiments hail principally from the United States.

It has been ascertained that under tension, aluminium is about as strong, section for section, as cast-iron, but when the fact is taken into consideration that pig-iron, or a similar part of wrought-iron or steel would weigh, section for section, three times as much as aluminium, the relative tensile strength of the metal assumes a further importance. The tensile strength is further increased by its being cold-rolled or cold-forged; and there are alloys which will not increase the specific gravity over, say, 3 or 3.25, which add very considerably to the tensile strength of the metal. For sections of structural work, where lightness is of importance, the metal has already found numerous applications in the building arts. Angles, plates, channels, and other sections of aluminium used in structural work, in commercial quantities, and the use of the metal in heavier pieces are the more recent developments of the metal for structural purposes.

The following table gives the average results of many tests of commercial aluminium :—

Strength of Commercial Aluminium.

	lbs.
Elastic limit per square inch in tension.	Castings 6,500 Sheet 12,500 Wire 16,000 to 30,000 Bars 14,000
Ultimate strength per square inch in tension.	Castings 15,000 Sheet 24,000 Wire 30,000 to 65,000 Bars 28,000
Percentage of reduction of area in tension.	Castings 15 Sheet 35 Wire 60 Bars 40
Elastic limit per square inch under compression in cylinders, with length twice the diameter.	lbs. 3,500
Ultimate strength per square inch, ditto	12,000
The modulus of elasticity of cast aluminium is about—	11,000,000

Aluminium in castings can readily be strained says Mr. Hunt, to the unit stress of 1,500 lbs.

* Abstract "Min. Proc. Inst. C.E.," Vol. I. (1877), p. 100.
† Mr. A. E. Hunt, in "Mineral Resources of the United States for 1892," 1893, p. 248.

per square inch in compression, and to 5,000 lbs. per square inch in tension. It is rather an open metal in its texture, and for cylinders to withstand pressure an increase in thickness over the ordinary formulae should be given to allow for its porosity. Taking the tensile strength of aluminium in relation to its weight, it is as strong as steel of 80,000 lbs. per square inch. In this connexion the following table by Richards is useful :—

Weight compared with Strength of Metals.

Metals.	Weight per cubic foot.	Tensile strength per square inch.	Length of a bar able to support its own weight.
	lbs.		Feet.
Cast iron.....	444	16,500	6.35
Ordinary Bronze ..	525	35,000	9.893
Wrought-iron.....	480	50,000	15.000
Hard structural steel	490	78,000	23.010
Aluminium.....	168	26,300	23.040

Under torsional stress in Thurston's machine the metal has much lower modulus of rigidity than iron or steel, its maximum shearing stress in castings being about 12,000, and in forgings about 16,000, being about that of pure copper. The angle of torsion is about equal to that of the softest steel.

Aluminium brass, an alloy prepared by adding spelter to aluminium-bronze, has a tensile strength of from 13 to 30 tons per square inch; the more bronze present the harder and stronger the brass. In regard to transverse stress a bar 1 in. square and 12 in. between supports broke with a load of 72 cwts. The form of aluminium brass, known as Hercules Metal, has a tensile strength varying from 30 to 40 tons per square inch, with an elongation of 10 to 30 per cent, according to composition of the metal.

Aluminium and nickel alloys are said to possess a tenacity of from 33 to 44 tons per square inch; tests by Kirkaldy gave results ranging from 39 to 42 tons per square inch.

METAL STATISTICS.

In order to give some idea of the British output of metals and non-metals used therewith, as raised in the United Kingdom, we may now give some brief statistics; but the student will understand that these figures by no means refer exclusively to metals used in building—it is impossible to separate them from others. The recent issue of the "Mineral Statistics of the United Kingdom for 1894" enables us, fortunately, to bring these particulars up to date as far as possible. The metals are considered in alphabetical order; all figures refer to the year 1894 :—

Alum Clay (Bauxite).—Raised exclusively in County Antrim, Ireland, from between sheets of Tertiary basalt—for (aluminium ore) refractory substances, &c. Quantity raised = 7,970 tons; value at the mines = 5,618*l*.

Antimony Ore.—None produced in the United Kingdom during the year; in previous years small quantities were raised from veins in Scotland and North Cornwall.

Arsenic.—White oxide, a by-product obtained in preparing the tin and copper ores of Cornwall and Devon. Quantity, 4,801 tons; value = 48,614*l*.

Arsenical Pyrites.—Excluding pyrites used in making the oxide above-mentioned; raised in Cornwall and Devon. Quantity, 3,288 tons; value, 3,823*l*.

Cobalt and Nickel Ore.—No returns. The only mine recently worked in Great Britain is in Flintshire.

Copper.—This industry is rapidly decreasing in importance in Britain. In 1863 the production of copper ore and copper precipitate amounted to upwards of 210,000 tons, valued at over a million sterling; whereas in 1894 the production was only 5,994 tons, valued at 16,222*l*. This latter is divided as follows :—Copper ore, 5,752½ tons, metallic copper obtainable by smelting, 397 tons, value (at mines) = 13,909*l*. Copper precipitate 241½ tons, yielding metallic copper 49½ tons, value = 2,313*l*. It is noteworthy that during the year we imported copper largely, as follows :—Ore, 82,805 tons; regulus, 78,845 tons; old, 3,245 tons; unwrought and partly wrought, 57,051 tons; manufactured copper, value, 140,181*l*. The last-mentioned came principally from France and Holland; the largest amount of regulus and ore was sent to us from Spain; whilst the unwrought and partly wrought came mostly from the United States.

Fluor Spar.—This is a very fluctuating commodity obtained from Durham, Derbyshire, and Cornwall. Quantity 126 tons, value = 69*l*.

Gold.—It is not generally known that we are

now raising quite a noticeable amount of gold. The returns refer exclusively to Merionethshire, and principally to the vicinity of Dolcelly. The value of the ore is the largest since 1888, when it was double as much as at present, though that year stands alone. Quantity of ore 6,603 tons, yielding 4,235 ounces of gold, estimated value = 13,573*l*. At bar gold prices the amount would yield 14,811*l*. By way of contrast, it may be observed that we imported, during the year, gold bullion and specie to the value of 27,572,347*l*, and exported 15,647,551*l*.

Iron Ore.—The principal iron-producing districts at the present time are Cleveland or North Yorkshire, yielding over four millions of tons annually, and Cumberland and North Lancashire, with an output of nearly two and a-quarter million tons. Open workings in Lincolnshire and Northamptonshire furnish a large quantity of cheaply-wrought brown iron ore. The ore raised in Scotland is chiefly "black-band ironstone." Totals—Iron ore, quantity, 12,367,308 tons, value = 3,190,647*l*; Pig-iron obtainable, quantity, 4,347,472 tons, value, 9,999,186*l*.

Iron Pyrites.—We depend chiefly on Spain and Portugal for our sulphur-bearing minerals; the quantity raised at home is very small—principally from Warwickshire, Derbyshire, Camarvonshire and Wiclrow. Quantity, 15,283 tons, value = 8,042*l*.

Lead Ore.—Found largely in several counties, though the proportion from Ireland is very small (value only 307*l*). The Isle of Man yielded more than Scotland and nearly as much as Wales by value, and about one-sixth of the whole of that raised in the United Kingdom. Totals :—Dressed lead ore, 40,599½ tons; obtainable by smelting, 29,687 tons; amount of silver obtainable from the lead, 275,696 ozs.; value of ore at mines, 266,995*l*.

Magnesium.—No statistics available.

Manganese Ore.—Principally from Merionethshire. Quantity, 1,809 tons; value = 740*l*. During the year we imported manganese ore to the value of 338,400*l*.

Ochre, Umber, &c.—Quantity, 8,516 tons; value = 14,040*l*.

Quicksilver.—None raised in the United Kingdom. Imports, principally from Spain, and in much lesser degree from Italy; quantity, 3,843,791 lbs.; value = 303,362*l*.

Silver.—All the silver of British origin is obtained from lead ores. Quantity, 275,696 ozs. value = 33,313*l*. Silver extracted from foreign cupreous iron pyrites, quantity, 311,413 ozs., value = 37,629*l*. Contrasting these figures with silver bullion and specie for the year, we imported 11,005,417*l*, and exported 12,165,049*l*.

Tin Ore.—All the tin ore now raised in the United Kingdom comes from Cornwall, with the exception of a few tons from Devon. Quantity, Dressed ore (black tin), 12,910½ tons; amount of tin obtainable by smelting, 8,327 tons 8 cwts.; value at the mines or works, 487,523*l*; or, taking the value at the market average of English block tin in London, it would be worth 604,500*l*; these are the lowest results that have been obtained for very many years. During the year we imported tin, principally from the Straits Settlements, to the value of 2,718,499*l*.

Uranium.—One mine in Cornwall; quantity, 19 tons; value = 815*l*.

Wolfram.—Two mines in Cornwall, neither of which produced any during the year. Contrast this with the year 1885, when 374 tons, valued at 4,799*l*, or with 1892, when 125 tons, valued at 3,000*l*, were raised.

Zinc Ore.—This is almost entirely blende, principally from Cumberland, parts of Wales, and the Isle of Man. Quantity, zinc ore, 21,821 tons, obtainable by smelting 8,130 tons; value at the mines, 67,311*l*. During the year we imported zinc ore, crude zinc, and manufactured zinc to the value of 1,373,262*l*, principally from Holland, Belgium, and Germany.

GENERAL BUILDING NEWS.

READING SCHOOL BOARD.—The resolutions passed by the Board on June 12 and July 10 to obtain by competition plans for the school and buildings to be erected in the Swansea-road were rescinded at their meeting on the 11th inst., and it was decided that Mr. G. W. Webb, of Reading, be appointed to prepare plans, &c., for the new buildings. The schools are to accommodate 1,000 to 1,200 children on the class-room system with central halls; also a cookery centre for 54 scholars, a manual instruction centre for teaching metal- and wood-work, and playbeds for gymnastic apparatus, &c. The architect is also to provide for a swimming-bath in the basement of the schools.

RESTORATION OF COLEBROOK CHURCH, DEVON.—The church, dedicated to St. Andrew,

restoration on November 30, after partial reconstruction, comprising the re-seating and necessary work in connexion therewith, including the removal of the modern west gallery, which completely blocked up the fine tower arch and cut off the tower, with its west doorway and window, from the rest of the church. Although much of the seating consisted of the usual high deal pews, there were many remains of fifteenth-century oak-seats with richly-carved bench-ends. These have been carefully repaired and restored, and all the oak not thoroughly decayed has been utilised as far as practicable. The rest of the seating is constructed of English oak, and designed in keeping with the old work. Among the remains of old oak-seating there was an interesting sixteenth-century carved oak prayer-desk, which has been carefully repaired, and will be again used as a prayer-desk. The whole of the works have been carried out by Messrs. W. Dart & Son, contractors, Crediton, under the direction of Messrs. Tait & Harvey, architects, Exeter.

RESTORATION OF RANGEMORE CHURCH, STAFFORDSHIRE.—The new chancel of Rangemore Church was consecrated on the 7th inst. by the Bishop of Lichfield. The edifice was built twenty-eight years ago from the design of Mr. Butterfield, and consisted of nave and chancel. In 1884 Lord Belper added an aisle on the south side in memory of his father, the founder of the church, stained-glass windows also being inserted, with the same object, by the tenantry and villagers. The old chancel has now been replaced by a longer and loftier one, in fourteenth-century style, the work being English in character. The walls externally are of Coxbench, and internally of stone-dressings, and the interior is of white Hollington. The chief feature in the design of the chancel is that the altar is placed in a deep recess, which has a stone-vaulted roof, supported by ribs carved and moulded, and is further embellished by two stone-carved figures of St. Augustine and St. Aidan, placed at a console level on either side of the altar. The windows are filled with stained glass. The floor is of black and white marble, varied in design with solid black marble steps, some of the patterns being copied from the Church of St. Anastasia, at Verona. The reredos is of alabaster, and reaches to the sill of the east window. It consists of three panels. In the centre is represented the crucifixion, with St. Mary and St. John on either side, while in the two smaller panels stands the figure of a bishop under a carved canopy. The whole is surrounded by a carved border of grapes and foliage. The altar has the legal ornaments of cross, vases, and candlesticks of gilt metal. The choir stalls are carved in oak. The vestry has been enlarged and refitted in oak. Hoptonwood stone has replaced the Minton tiles in the nave; while a new oak pulpit, with panelling at the back and extensive carving, and steps and base of Purbeck marble, has been introduced. The outlay involved by the alterations is about 4,000l. The work was designed by and carried out under the superintendence of Mr. Bodley, A.R.C.A., and the chief contractors were Messrs. Riddell & Son, of Grantham, Mr. Bridgman, of Lichfield, being responsible for the carved oak work for the ceiling and the stone figures, and Mr. Hodges (Burton) for the stone floor.

BLACKWALL TUNNEL WORKS.—The following works at the Blackwall Tunnel are finished, namely, the sewers on both sides of the river, the fire-proof fence and the approach road at Messrs. Forbes, Abbott, & Lennard's premises at Ordnance-wharf, and the Northumberland-wharf river wall. The works for all the shafts are now sunk to their final level. In the east-iron-lined part of the tunnel one ring has been erected during the past month. This completes the east-iron lining beneath the river between shafts Nos. 2 and 3. The shield is in position to start out from the north side of No. 2 caisson, and the plug is being removed. Nine east-iron rings have been placed temporarily across No. 2 shaft, so as to give the shield an abutment to push from. On the south side of the river the cut-and-cover work is completed, and on the north shore, out of a total distance of 436 ft., a length of about 380 ft. is finished, and the remainder is formed up to springing. The total approximate cost of the work executed up to the end of November last is 57,215l., of which the sum of 10,095l. represents the value of the work done on the raised approach road, the cost of the work carried out during the month being estimated at 1,645l. The work of widening Blackwall-lane and Trafalgar-road is now finished with the exception of some 200 ft. from the south side of the latter thoroughfare, and this it is believed will be completed in the course of a week or two. The whole of the carriageway has been opened to traffic.

BOARD SCHOOL, CARDIFF.—New Board School buildings have just been erected in Howard-gardens, Cardiff. The structure now the offices of the Board, which fronts the Howard-gardens, was originally two villa residences. On the ground floor are the clerk's and general offices; on the first floor the Board-room, inspector's office, &c.; and on the second floor the school attendance officers' offices, the superintendent's offices, &c. A central gable has been erected which has been carried out in the Perpendicular style to accord with part of the old portions. In addition to these offices, there is in course of

erection at the rear a large building to be used for the purposes of a pupil teachers' school, art school, and gymnasium. The school will be 126 ft. long by 42 ft. wide, two stories in height, and the gymnasium will measure 42 ft. long by 38 ft. wide. There will be four class-rooms, capable of holding 50 persons each, and in connexion with the art class-rooms there will be a clay-modelling department. Adjoining the gymnasium will be a students' workshop, where youths will be taught the use of lathes and carpenters' tools and machinery, as well as in various other branches of technical instruction. The architects are Messrs. J. P. Jones, Richards, and Budgen, Cardiff; the contractor is Mr. Henry Davies, Cardiff; and the clerk of works, Mr. David Evans.

CHURCH, GATESHEAD.—The foundation-stone of the new Church of St. George, Durham-road, in the parish of Christ Church, Gateshead, was laid on the 16th inst. by Lord Northbourne. The building is being erected at a cost of 5,900l., including the tower. The accommodation is for 630 adults. The church consists of chancel, nave, north and south transepts and aisles, and organ-chamber, with choir and clergy vestries on the south side. The latter are arranged so that they may be used as one room for meetings, and have an entrance from Inskip-terrace. The nave is 27 ft. wide by 49 ft. to the ridge, divided into five bays, with narrow aisles, and windows on each side. The roof is of oak, and the principal being that at the south-west angle, through the tower. The exterior walling is of local stone, sneck-faced, and the interior piers and arches are of stone, chisel-dressed, the general finishing being plaster. The floors of the nave will be of wood, with wood-block flooring in the chancel. The floor of the chancel will be covered with encaustic tiles. The windows will be filled with tinted cathedral glass in leaded lights, and the heating is to be by hot water, on the low-pressure system. Mr. Stephen Piper, Newcastle, is the architect, his plans having been selected in a limited competition, in which Mr. W. Walton-Wilson was assessor. The contractor is Mr. Alexander Fringle, of Gateshead, and Mr. Richley is acting as clerk of the works.

PREMISES, STOWMARKET.—The Stowmarket Charity Trustees are building premises at Stowmarket from the designs of Mr. Henry Geo. Bishop. Messrs. Andrews & Murray are the contractors. The floors are to be fireproof on the Mark & Fawcett's system. The constructional iron and steel work is being supplied and fixed by Messrs. Mark Fawcett & Co., of Westminster.

FIRE STATION, BIRKENHEAD.—On the 17th inst. the new Fire Station for Birkenhead was opened by the Mayor (Mr. George S. Oldham). The station is situated at the junction of the Whetstone-lane and Borough-road, near Claring Cross. The site is of a triangular shape. The buildings comprise the Fire Station proper, with superintendent's house, and quarters for twelve single men, and has the main elevation to Whetstone-lane, which has been widened opposite the buildings to 50 ft. The engine-house fronts on to Whetstone-lane, and is lined with glass bricks and paved with small clinker bricks. It has accommodation for two steamers and a hose tender, all of which can be taken out direct by means of three large folding doors opening clear on to the road. In immediate connexion is the recreation room for the firemen, and adjoining is the duty-room and superintendent's office. In the duty-room are placed all the fire alarm indicators in connexion with thirty-four electric and telephone alarm-boxes, erected all over the borough, fire-bell, and house alarms. In the yard at the rear there is a four-stalled stable, loose box, blacksmith shop, joiner's shop, hose store, and a boiler pit to allow of the boilers being lowered out of the steamers for repairing purposes. The superintendent's house is immediately over the recreation-room and office. The single men's and engineer's houses are over the engine-room. In the basement, in addition to the coal cellars, a large washing cellar is provided with boiler, &c., for the general use of the station. Each of the houses is fitted with alarm-bell in connexion with the duty-room, which by one movement can be set ringing simultaneously. The engine-house doors and the stable-doors are fitted with Try's patent rapid-opening fittings, and are intended to be worked from the office. The buildings have been erected from the designs and under the superintendence of the Borough Engineer (Mr. Charles Brownridge, A.M.Inst.C.E.), Mr. James Merritt being the contractor. The fire-alarms have been erected by Mr. W. Shaw, of Stockport, and the fire-bells and automatic switch by Mr. F. Pulford, of Birkenhead.

MUNICIPAL TECHNICAL SCHOOLS, BIRMINGHAM.—The new Municipal Technical schools, which have been erected in Suffolk-street, Birmingham, were opened on the 13th inst., by the Duke of Devonshire. The cost of the building and land has been nearly 80,000l., and the architects were Messrs. Essex, Nichol, & Goodman, Birmingham. The building is constructed of brick, with terra-cotta facings. It consists of a main block, flanked with an east and west wing. The main entrance is one of the features of the facade. Spanned by a wide, deeply-recessed elliptical arch, enclosing four pairs of swing-doors, it is rich in modelled ornament, and in the spandrels are figure-subjects representing various sciences.

These figures are repeated inside, and form part of the decoration of the staircase-hall leading to the staircases and corridors, which are also lined with enriched terra-cotta. The city arms are freely used, along with ideal human, animal, and foliated forms. Inside the building no fewer than 115 apartments are available in the five floors. On the ground-floor are the Assembly-hall of the Examination-room, the Library, and Secretarial Department, with rooms for the committees, principal and secretary. The interior framework of the building is of steel. Heavy steel columns rest on a solid rock foundation, and these columns are carried up to the top of the structure, being riveted together by means of heavy cross beams at each floor. The spaces between the steel floor girders are filled in with granolithic flooring, which is strengthened by steel wiring. In the Assembly-hall the floor is of pitch-pine, arranged in panels; the walls, for two-thirds of their height, consist of a glazed ware dado, surmounted by arched terra-cotta screen on the walls, the upper part being a flat, old-gold frieze, giving relief to the lower part. The ceiling is painted and moulded. The platform and roof are panelled in oak and walnut. The ornamentation of the library only differs from that of the hall in that the books of the former supply the decorative arcading of the latter. Three large lecture-rooms adjoin, each giving accommodation for 250 students. Each lecture-room has preparation-rooms and stores closed at hand. There are two staircases at the junction of each wing with the central block. The first and second floors surround the two galleries lecture-rooms placed over the Assembly-hall, and contain the departments for physics, electrical engineering, telegraphy, and the class-rooms for women, botany, geology, &c. The Physics Department occupies the west wing towards Scotland-street, and various rooms communicate, so that long range for optical work can be obtained, whilst in close proximity are two dark-rooms for photography. In a similar position in the east wing are the Electrical Engineering and Telegraphy Laboratories, and the Laboratory room are the Experimental Dynamo and Battery Rooms, connected with the source of mechanical power in the basement. In the Women's Department the only portion fully equipped so far is the botany room. The third floor is entirely devoted to chemistry, with the exception of one-half of the east wing, which is kept for mechanical drawing. On the fourth floor there are to be found a large room for building construction and another for geometry. On the lower ground floor is the Metallurgical Department, including electro-metallurgy and brazing, and, in the east wing, the workshops for carpentry, joinery, and pattern making. On the basement are a large lecture-room for metallurgy, mechanical laboratory, workshops for iron and steel, brass and other metal trades, while the sub-basement is devoted to engine rooms for electric lighting and motive power, space for boilers, heating apparatus, &c. The building is, as far as possible, built of fire-proof materials. The rooms are warmed throughout with hot air.

THE BUILDING TRADE IN ABERDEEN.—During this year house-building has been actively carried on in all the suburban districts, as well as in two sites nearer the centre of the city. Beyond the dispute as to joiners' wages previously noted, no difference between employers and employed occurred. An exceptional number of workshops have been erected in 1895. During the twelve months from January to December inclusive the Town Council have sanctioned the plans of 210 dwelling-houses; fifteen blocks of dwelling-houses and shops; eight cottages; two villa-residences; forty-three factories, workshops, &c.; sixty alterations and additions (many of them on a large scale) at various premises; and forty-two miscellaneous erections, including warehouses, offices, stables, small stores, &c. Plans of six new public schools, halls, hospitals, &c., were also approved of, as well as nine plans of alterations and additions in buildings of this class. The Government are to erect a new general post-office on a central site, to meet the increased wants of the city. The prospects in the building trade generally are still remarkably good. During 1895 fourteen steam-vessels were launched, the aggregate tonnage being disappointingly small; but a considerable amount of repairing work was done. There are in hand ten steam-liners and two small steamers.

SANITARY AND ENGINEERING NEWS.

BROWNHILLS SEWERAGE SCHEME.—At the meeting of the Brownhills Urban District Council, held on the 11th inst., after the report of Mr. J. T. Eays, the assessor, with reference to the competitive plans for the sewerage of the Walsall Wood District had been considered in committee, the plans of Mr. H. Bertram Nichols, C.E. ("Forward"), of Birmingham, were adopted by eight votes against four for Mr. W. H. Radford, C.E. ("Gravitation"), Nottingham, who was awarded the second premium. The estimated cost of the selected scheme in regard to the engineering work is 9,387l. Thirteen schemes were submitted.

SEWAGE DISPOSAL AT SHEPTON MALLETT.—Much difficulty has been experienced in dealing with the sewage of this town, mainly by reason of the enormous quantities of brewery refuse which were formerly present in the sewage the sewage-

farm was also badly laid out, and was until recently in a deplorable condition. Owing to the pressure brought to bear upon the Local Authority by a riparian owner, it became necessary to remedy the state of affairs, and, acting under the advice of Messrs. Taylor, Sons, & Crimp, of Westminster, the Urban District Council have constructed efficient works for the chemical treatment of the sewage, for the filter-pressing of the sludge, and have also brought the farm into a thoroughly efficient condition.

IMPROVED PATENT TIPPING VAN.—Mr. Geo. Rowe, of Lower Edmonton, sends us particulars of his tipping van for slops and dust, which can be tipped no matter in what position the horse and front wheels may stand, either in a direct line with the hind wheels, or half turned, or at right-angles. The patent tipping apparatus allows the load to be tipped gradually and held at any angle, thus preventing the slop from splashing about and avoiding that strain on the body which takes place when vans are tipped up all at once.

FOREIGN AND COLONIAL.

FRANCE.—The Société Centrale des Architectes Français continued the general elections last Sunday for the Bureau and the Administrative Council. The result is as follows:—M. Charles Garnier, President; MM. Corroyer, Achille Hermant, and Newham (of Lille), Vice-Presidents; MM. Boileau, Secretary; Poupinel, Assistant-Secretary; L. George, Corresponding Secretary; Frantz Jourdain, Keeper of the Records; and Bartaumiaux, Treasurer; MM. Raulin, Guadet, and Lalanne, Controllers of the Press; MM. Walton, Etienne, Roux, Daumet, Duchatelet, Delaage, Gautier, Parisian Delegates to the Council; MM. Marmottin (of Coulommiers), Perrin (of Lyons), Faget (of Bordeaux), Beignet (of Angers), Provincial Delegates. An underground chapel, recalling in miniature the tomb of Napoleon at the Invalides, is to be built at the Pasteur Institute, to receive the remains of the great savant. It will be under the principal entrance. M. Menzel, artist, of Berlin, has just been elected an Associated Foreign Member of the Académie des Beaux-Arts, in place of the late Mr. H. Hunt, of New York. The fourth annual exhibition of American lady artists is open, in the Rue de Chevreuse, and will be closed at the end of May. A college is to be built at St. Germain-en-Laye, the expense of which is calculated at 300,000 francs. The Committee on Historical Monuments has given a favourable answer to the project presented by the architect, M. Revail, relating to the preservation of the monuments and ruins of the ancient city of Baux, near Arles. The Minister of Fine Arts has in consequence given a sum of money for the restoration of the tower of the chateau, and of the chapel which will form the Lapidary Museum, also something for the preservation of the Church of Baux and its beautiful turret. On Sunday last the new buildings of the Lycée at Tours were inaugurated, also the Medical College at Rheims. A fine chapel is to be erected at Biarritz, in the neighbourhood of Thermes-Salins. A municipal building is shortly to be erected in the town of Annecy. A sum of 125,000 frs. has been given for the restoration of the palace of the Ducs de Bourgogne, at Dijon. M. Albert Ballu, principal architect of historical monuments in Algeria, who has already the charge of the diocesan buildings of Algiers and Oran, has also been appointed diocesan architect of Constantine. The Académie des Sciences of Architecture at Lyons, has given the first prize for the open competition in architecture in 1895, to M. Paul Cret, pupil of MM. Huguier and Bernard; and the second prize to M. Maxim Roisin, pupil of M. Blondel. The subject was the decoration of the Place Bellecour. The town of Marseilles has just opened a competition for a building for the Faculté des Sciences. The town of Geneva is said to be going to oppose, by every means in its power, supplying Paris with water from the lake. The death of M. Louis Aimé Bouchain at the age of 52 is announced; he was a member of the Société Centrale. He was a pupil of M. Fourdrain and of the Ecole des Beaux-Arts.

GERMANY.—The Emperor has given 500l. towards the cost of the monument which is to be erected near Leipzig on the great battlefield of the same name. A competition has been held for the design of the monument. At the Royal Academy there is a special exhibition of paintings by Achenbach, Menzel, and Schröder. Of the private galleries we must mention Schulte's rooms, with some of Professor Herkomer's work, and some paintings by Krumpholtz, of Vienna. The painter Menzel celebrated his eightieth birthday on the 8th inst., when there was a large reception at the Royal Academy and numerous banquets, and the popular painter received many addresses and distinctions. The gigantic bronze "Berolina" is now being erected on the Alexander Platz at Berlin. Professor Hündorff is the sculptor. The new West Theatre at Berlin is being rapidly completed, and is already roofed in, as the building has to be opened in time for the Industrial Exhibition next May. The frontage is about 140 ft., and its depth nearly 200 ft., and it is situated in its own extensive grounds facing the Kant Strasse. The plans,

which have been prepared by Herr Sehling, show seating accommodation for about 1,800. Six hundred seats are in the "area," i.e., combined first and second stalls. The stage has a width of about 65 ft. An unfortunate accident is reported from Munich in connexion with the new "German Theatre" which is nearing its completion. The scaffolding broke down, and there were several fatalities. The competition for designs of the new provincial museum at Hanover has been decided in favour of Professor Stier's work. There were forty-two competitors.

SAXONY.—The first series of alterations to the Royal Castle at Dresden has now been completed, and no further work can be taken in hand until more money has been voted by the Saxon Diet, the first instalment having been entirely exhausted. The first series of alterations included a very successful remodelling of the principal façade of the castle looking towards the "Zwinger," and some very satisfactory work in the German Renaissance style of the sixteenth century takes the place of the nondescript exterior which was formerly an eyesore in the picturesque surroundings. One of the large staircases has also been rebuilt, and is decorated in Louis XIV. style, together with a number of the larger reception-rooms. Messrs. Dunger and Froelich, both Court officials, were the architects, and Herr Roch, the sculptor, superintended the plastic decoration. At Dresden the authorities are now considering a scheme for a new Natural History Museum, so as to leave more room in the historical "Zwinger" for the Royal porcelain collections. Professor Meyer, the custodian of the Zoological Museum, is taking an active part in this scheme. There is also a scheme for a new Record Office, so as to relieve the "Albertinum," which is already overcrowded, and a new picture gallery for modern works of art, as Gottfried Semper's Gallery is also overcrowded. Several votes have been passed in reference to a movement to open the galleries in the evening, and experiments are to be made with the electric lighting of several rooms.

MISCELLANEOUS.

LECTURES ON ARCHITECTURE AT DARLINGTON.—During the last twelve weeks a course of lectures has been delivered at Darlington by Mr. D. H. S. Cranage, M.A., lecturer under the "University Extension Scheme," on "Medieval Architecture," and excursions were made to neighbouring buildings to illustrate the styles lectured upon. The most important place visited was Durham, where Mr. Cranage lectured to about 200 ladies and gentlemen in the Cathedral, and Mr. J. P. Pritchett, of Darlington, did the same in the Castle. The churches of Wycliffe, Heighington, and Staindrop were also visited; the class being conducted each day by Mr. Pritchett, who explained the architecture with special reference to Mr. Cranage's lectures. The closing lecture was given last Wednesday in St. Cuthbert's Church, Darlington, but as the class of 200 was too large to conduct at one time, Mr. Cranage gave his lecture twice, and each time, after the lecture, the half-class was again divided into two parties of about fifty each. Mr. Cranage explaining the details of the church to one party, whilst Mr. Pritchett described the features of the nave and transepts to the other half; after which the parties changed places, and so all had every part thoroughly dealt with.

CHRISTMAS CARDS.—Messrs. Beeching, of the Strand, send us some pretty and rather novel Christmas cards designed specially to be sent from London to country friends, containing sketches of London buildings and scenes, leaving a margin for the greetings. This is entitled the "Metropolitan Series"; they also produce a "Homeland Series," in which a sketch of the sender's house can be introduced; and a Temple series supposed to be attractive to the Bar, who, however, for the most, we fear, do not set much value on the exterior picturesque of their realm.

VENTILATION AND WARMING, &c.—We are asked to state that the business of Messrs. Baird Thompson & Co., ventilating engineers, has been acquired and is being carried on by a new company under the title of the "Grabtry Ventilating and Engineering Company, Limited."

ST. NICHOLAS, DEPTFORD.—We read in *Notes and Queries* that a fine piece of oak carving, ascribed to Grinling Gibbons, has been removed from over the porch of the chancel-house, in the churchyard, into the interior of the church, and is now protected by a glass case. The subject of the carving is Ezekiel's vision in the valley of Dry Bones.

THE SANITARY INSTITUTE.—At an examination for Inspectors of Nuisances, held in London on Friday and Saturday, December 6th and 7th, 1895, 128 candidates presented themselves. Questions were set to be answered in writing on the 6th, and the candidates were examined *ad hoc* on the 7th. The following 18 candidates were certified as regards their sanitary knowledge competent to discharge the duties of Sanitary Inspectors:—H. Adams, Islington; W. J. S. Adams, Bournemouth; S. P. Andrews, Hertford; W. G. Auger, Clapham, S.W.; K. J. L. Banerman, Hackney; W. Baxter, Stroud Green; Miss I. J. Bird, Clapham Common; A. Boyd, Belfast; J. G. Brehant, Highgate; W. G. Bugg, Battersea Rise; J. H. Bull, East Croydon; G. Clarke, Beckenham;

T. A. J. Tilsed, Collingwood, Coalville; W. A. Collins, London; C. B. Cook, Chelsea; A. Cornell, Romford; T. Cutting, Notting Hill; F. Dawkins, Southampton; A. M. Day, Limehouse; Miss J. L. de Pledge, London; G. T. Dewey, Camberwell; I. W. Dickinson, Bournemouth; F. B. Dickinson, Sheffield; F. T. Dunmore, Crouch End; J. L. Duro, Ilkley; D. Edwards, Tonbridge; R. R. Egan, Birmingham; J. Elison, Ripley; Derby; W. Firth, Dalston; J. R. Fleck, Lavender Hill; E. W. Fricker, Westminster; H. N. Fryer, Grays; H. Gordon, Islington; J. H. Gray, Leicester; J. T. Griffin, Chingford; L. Hanks, Berners-street; W. R. Harris, Upton Park; T. W. Hayward, Weston-super-Mare; F. A. Heryet, Greenwich; F. B. Hill, Highbury Hill; Miss E. M. Homersham, Tufel Park; W. W. Howes, Maidstone; A. T. Hubble, Bloxwich; A. Hudson, Nuneaton; Miss A. M. Johns, Bournemouth; C. Johnston, Islington; E. F. Kemp, Clapton; J. S. Knight, Basingstoke; W. J. Lambert, Swansea; A. R. Lane, West Kensington; C. Langstone, Westminster; H. C. Leat, Tottenham; F. T. Long, London; J. Mansell, Hackney; W. Mant, Emsworth; H. Mardell, Leytonstone; E. W. F. Martin, Tunbridge Wells; J. F. B. May, Tunbridge Wells; G. R. Metzler, Chelsea; R. J. Millward, Hampstead; G. G. Morley, Peckham; J. F. Norris, Stoke Newington; C. Outbitt, Nelson; E. W. Penn, Walthamstow; F. A. Pratley, Cheltenham; G. Rackham, West Hampstead; J. Seig, Paddington; A. Sims, Romford; F. W. Sinclair, Lavender Hill; A. Smith, Bristol; A. C. Stephens, Longford-street; J. W. B. May, Forest Gate; W. J. Storer, Clapham; T. Sinson, Shepherd's Bush; W. Tedham, S. Norwood; F. B. Thorpe, Selhurst; A. R. Warren, St. John's; Miss Ada F. Webb, London; C. J. Webber, Bristol; J. W. Webster, Windsor; H. T. Whitewood, Ryde, Isle of Wight; J. E. Winter, Tottenham; W. Wynne, Harrow-on-the-Hill. At an examination in Practical Sanitary Science, on December 6 and 7, the following ten candidates were granted certificates in Practical Sanitary Science:—A. Carter, Upper Holloway; A. W. Collins, Peckham; C. King, Norwich; F. W. King, Malden; J. Law, Farnborough; W. G. Moyle, London; W. Narramore, Liverpool; J. Parham, Crouch End; J. W. Parry, Assoc. M.Inst. C.E., Anerley; C. E. Wilkinson, Waltham Green.

THE CHRISTMAS HOLIDAYS.—Next week, the *Builder* will be published on Tuesday, and to ensure attention all communications for the Editor must reach the office by Monday morning.

CARDIFF MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Cardiff Master Builders' Association was held on the 13th inst. at the Angel Hotel, Cardiff. Alderman D. Jones, J.P. (President), was in the chair. After dinner the usual loyal toasts were honoured, and Mr. Edward Seward proposed "The Army, Navy, and Reserve Forces," to which Major C. Rigg responded for the Volunteers. Mr. James Turner gave "The Architects and Engineers," and Mr. W. Harpur (Borough Engineer) and Mr. Councillor F. J. Veal replied. Mr. W. Symonds submitted the toast of "The Cardiff County Council."—Alderman P. W. Carey (Mayor) and Councillor G. David responded. Mr. George Thomas proposed "The Cardiff Master Builders' Association," congratulating its members upon being free from labour disputes, and upon the happy relations now existing between employer and employed. The Chairman first responded. He said the past year had not been characterised by anything specially important, but they had had to mourn the loss of some who had passed away, especially of the late Hon. Secretary (Mr. W. S. Jones), who was most energetic and full of practical work. Mr. Wells, he believed, would supply all their needs in succession to Mr. Shepherd as Hon. Secretary. Speaking upon general trade questions, and touching upon the great engineering strike in particular, he advocated, as the only successful method of settling disputes between employers and employed, the appointment of an official, empowered by the Government, whose decisions, as arbitrator, upon all questions should be final and loyally accepted. He went on to say that the building trade in Cardiff had been successful during the past year, the houses erected—about 1,200—being in excess of the average for the past ten years. In regard to charges of jerry-building, he spoke of the improvements effected in recent years in the thickness of walls between houses, and also in matters of sanitation. Mr. F. S. Lock (Vice-President of the Association) also responded, observing that the builders of Cardiff endeavoured to do their work honourably, and he was prepared to put their work in comparison with that of builders in other towns.

ELECTRIC LIGHT IN THE CITY.—On the 12th inst., a meeting of the Court of Common Council was held at Guildhall, the Lord Mayor presiding. Mr. W. S. Lock, Mr. Brooke Hitching, who asked, in view of the high price charged for the electric light in the City—8d. an unit in place of 6d. in other districts—whether the Commission of Sewers had the right of purchase at short notice and on equitable terms. Mr. H. T. Gordon, Chairman of the Commission, said they were about to enter into a contract for public lighting, but it could not be completed until they had decided which was the best system of lighting the minor

streets. The Commission would have the option of determining the contract at the end of seven, fourteen, or twenty-one years, and at the end of twenty-one years, of purchasing the undertaking outright. Meanwhile the company would have a monopoly. Mr. Alderman Bell, dissenting from Mr. Gordon's view, said there was nothing to prevent any other company coming forward, and the Commission of Sewers had no power to grant any exclusive right to a particular company.

STATUETTE OF THE ARCHDEACON OF TAUNTON.—The Archdeacon of Taunton, George Anthony Denison, M.A., celebrated his ninety-first birthday on the 11th inst., and amongst the birthday gifts received by him was a statuette of himself, vested in his robes, and wearing a skull cap. It represents the archdeacon as he is at present, and was modelled by Mr. Harry Hems, of Exeter.

HOW TO KEEP OUT FROST.—Under this title Mr. R. W. Boyd, of Bond-street, publishes a useful paper of directions to householders how to guard against the principal inconveniences caused by frost, and especially in regard to the freezing up of pipes, cisterns, &c.

THE LONDON BUILDING ACT: TRIBUNAL OF APPEAL.—The Secretary of State for the Home Department has appointed Mr. A. A. Hudson, barrister-at-law, to be one of the members of the Tribunal of Appeal under Section 175 of the London Building Act, 1894, in the place of the late Mr. D. Cubitt Nichols.

POET'S CORNER, WESTMINSTER.—By order of the First Commissioner of Works, the block of eight old houses in Poet's Corner and Old Palace-yard, Westminster, were sold on the 16th inst. by public auction as bricks and mortar, and the work of demolition has commenced. It was upon the site of these houses that Mr. Yates Thompson some time ago offered a sum of 38,000l. for the erection of a memorial chapel, and although the offer was declined at the time, as the Commission disagreed as to the exact locale (which was the principal condition attaching to the gift), it is more than probable that it may before long be repeated. Among the lots to be disposed of yesterday were a couple of six-panelled doors at No. 3, Old Palace-yard, with carved mouldings, linings, and architraves, and finely-carved pediments. There were also several marble chimney-pieces, with carved wood dressings and mantels, and others with Siena marble centres.—*Daily Chronicle.*

NORMAN ARCHITECTURE.—In a lecture at the London Institution on the 16th inst., Mr. Arnold Mitchell spoke of the fortress-like churches which were erected by the Norman builders, in which light was only admitted by narrow slit-like windows, piercing walls built massive thick in order to stand alone without the aid of buttresses, the use of which had not then been discovered. There could be no doubt that the village church was very often used as the village fortress. The windows were only narrow and slit-like at the outside. Inside they were expanded in the well-known fashion in order to give the archer play for his bow. The village church is, practically, a fortress even to-day. What a contrast with, say, the nave of Winchester, where one of the windows fills up the entire end of the nave with its glorious bar tracery. It was curious to discover from the frescoes that have been brought to light in early churches that the original Gothic idea embraced colour for interior embellishment. The lecturer had some interesting facts to note about the few existing Saxon buildings we still possess. In the nave of a little church at Colchester one might see a triangular-pointed arch, built before our English masons had actually learned how to cut the wedge-shaped stones which later were found essential for turning a true arch. Such arches are found in Egyptian tombs.

SURVEYORSHIP APPOINTMENT.—At the Court of the Worshipful Company of Fishmongers, held at their Hall at London Bridge on the 18th inst., Mr. Howard Chatfield Clarke, of 63, Bishopsgate-street Within, E.C., was elected Surveyor to the company.

THE SLATE TRADE.—Prices for the coming year have now been arranged at all the quarries, and show a moderate increase. Trade being so brisk a higher advance was anticipated by many, but the leading quarry owners prefer keeping prices at a figure which will not induce the importation of foreign slates.

BEDFORD COURT MANSIONS.—Messrs. Archibald Smith & Stevens ask us to state that the lifts in this building, illustrated in our issue of Dec. 7, were erected by them.

TRADES TRAINING SCHOOL.—The Rev. Dr. Wace (Principal of King's College) presided over the annual distribution of prizes in connexion with the Trades Training School at Great Titchfield-street on Wednesday. The ceremony took place in the Carpenters' Hall, London-wall, and was performed, in the absence of Mrs. Wace through indisposition, by Mrs. Stanley Bird. Professor Banister Fletcher, the Chairman of the Technical Committee, in giving an account of the work connected with building construction, stated that the number of those attending the classes in masonry, bricklaying, joinery, plastering, plumbing, and other branches was 185. He might mention that all the tools required by the students had been made by themselves, and as a further proof of good and sound work he might say that thirty-one students presented themselves at the Carpenters' Hall for examination in sanitary building construction, and twenty-

five had been successful. Next year a wood-carving exhibition would be held in conjunction with the Joiners' Company.—Mrs. Stanley Bird then presented numerous prizes to the successful competitors, and afterwards the certificates gained at the Carpenters' Company's recent examination on sanitary building construction, and the prizes to the successful students at the company's organised science school and workshops at Stratford.—Mr. Alfred Preston, with reference to the latter institution, said that during the last twelve years much good work had been done by the school. They also had a swimming and other baths, of which 70,000 people had availed themselves during the last year, so that nobody could say that the company was not doing something useful, not only for the mental training, but also for the bodily health of the people. The chairman afterwards addressed the gathering, impressing upon them the importance of technical education.

THE MUNICIPAL MUSEUM, PARIS.—The Museums Department has just acquired two interesting works. One is a sketch by the late Charles Muller for a ceiling in the old Hôtel de Ville, which was burned in 1874, the subject being the enfranchisement of the communes by Louis le Gros. The other is a coffer of Renaissance date, damascened in gold and silver, and the sides decorated with figures representing the 'Seven deadly Sins.' It is intended ultimately to place this in the Musée Galliera.

LEGAL.

SURVEYORS' CLAIM FOR A VALUATION.

THE case of Clutton v. Clarke came before Mr. Justice Willes, sitting without a jury, in the Queen's Bench Division, on the 13th inst., it being an action brought by Messrs Clutton & Sons, surveyors and estate agents, of Whitehall-place, to recover from the defendant, Mr. Thomas Clarke, 840l. for work done under a contract.

Mr. Channell, Q.C., Mr. Tindal Atkinson, Q.C., and Mr. Meek appeared for the plaintiffs; while Sir Edw. Clarke, Q.C., M.P., and Mr. Crispe represented the defendant.

Mr. Channell, in opening the plaintiffs' case, said that in 1892 the defendant, who was the owner of a large block of buildings at the top of Chancery-lane known as the Chancery-lane Safe Deposit, was desirous of forming a company to take over the property. He thereupon instructed the plaintiffs to make a valuation of the property, agreeing to pay them 100 guineas for the preliminary report in any event, 500 guineas for the report which was made up for the purpose of promoting a company in the event of the company going to allotment, and only three-fourths of the capital being subscribed, and 800 guineas if the whole of the capital of the company was subscribed. In March, 1894, the plaintiffs made a valuation, in which they stated that the rents amounted to 22,000l. per annum, as against 15,250l. at Christmas, 1887, and they estimated that the buildings, excluding the Safe Deposit, would yield a gross rental of 26,000l., that the sales and strong-rooms would produce about 30,000l. per annum, and that the value of the leasehold interest, as between vendor and purchaser, was 287,000l. On receiving the valuation defendant got out a draft prospectus and entered into negotiations with certain gentlemen. A difficulty then arose in consequence of the defendant having lost a book which contained some of the information upon which the plaintiffs had based their valuation, and thereupon some of the gentlemen who had been negotiating with the defendant advised the company offered to purchase the whole concern for 280,000l., the object being to form a private company. This offer the defendant accepted, and the property was sold to a company of which the whole capital was subscribed. The defendant contended that he was not bound to pay more than 100 guineas, but the plaintiffs were entitled to recover 800 guineas, which was less than the fee ordinarily charged for work of that kind. Moreover, it was clear that the plaintiff's valuation was used by the defendant to effect a sale of his property to the private company, and that he agreed to supply a copy of the valuation to the company and to produce the original if required.

Evidence having been given by Mr. Ralph Clutton, one of the plaintiffs, and by Mr. Samuel Garrett, a solicitor, who said that the property in question was sold to a private company for 280,000l., Mr. Mills, one of the directors of the company, was called, and said that the capital of the company was 280,000l., divided into 1,000 shares of 280l. each, but only 200,000l. had been raised.

Sir Edward Clarke contended that as three-fourths of the capital of the company had not been raised the plaintiffs were only entitled to 100 guineas, and his Lordship held that on the construction of the contract the plaintiffs were only entitled to 100 guineas. As the defendant had paid 100 guineas into Court in satisfaction of the plaintiffs' claim, judgment was entered for the defendant with costs.

APPLICATION TO RESTRAIN A LANDLORD FROM ALTERATION OF HIS PREMISES.

THE case of Hudson v. Cripps came before Mr. Justice North in the Chancery Division on

the 13th inst., on the motion by a Mrs. Hudson, who was the tenant of a flat on the second floor of Oxford Mansions, near Oxford Circus, a building which was erected about twenty years ago for the purpose of being let in flats, to restrain her landlord, until the trial of the action, from going on with certain alterations on the premises, which had been commenced with the view of providing accommodation for a new club, to be called the Cavendish Club. The building is a quadrangular one, with a court in the middle, having one common entrance and staircase for the use of all the tenants, the premises on each floor having access to the general staircase by means of verandahs communicating therewith. It appeared that Mrs. Hudson held her flat under an agreement executed last March, determinable by her at one month's notice after the first year, and by the landlord at one month's notice after the first three years. The agreement, moreover, contained various stipulations and conditions, the effect of which limited the use of the premises to the purposes of a residential flat. The whole of the premises had been, until recently, used as residential flats, with the exception of certain rooms on the ground-floor, looking on the street, which had been used as offices.

His Lordship, after hearing the arguments of counsel, in giving judgment said that, having regard to the fact that the agreement was in printed form and that the premises were occupied when the agreement was made, and had been for many years occupied as residential flats, and at the various provisions contained in the agreement, he thought it clear that those provisions were intended to apply to all the flats for the mutual protection of all the tenants. The case seemed to him to come within the principles laid down by the House of Lords in *Spicer v. Martin*. What the defendant had done was to proceed to convert a building intended to be used as residential flats into a fashionable club, and he thought that there was such a departure from the terms of the agreement that she was entitled to an injunction. In those circumstances the defendant must be restrained from using the premises, or permitting them to be used, as a club or otherwise than as residential flats, and from making alterations in the premises for that purpose.

Mr. Swinlen Eady, Q.C., and Mr. Bradford appeared in support of the motion, and Mr. Buckmaster opposed.

DISPUTE OVER A BUILDING CONTRACT.

THE case of Bartlett v. Ford's Hotel Company, Limited, came on Monday last before the Court of Appeal, composed of the Master of the Rolls and Lord Justice Kay, on the appeal of the plaintiff, Mr. Herbert Henry Bartlett, a builder, that a decision of Mr. Justice Lawrence, in Chambers, refusing to grant an injunction to restrain the defendant company, their servants and agents, including Mr. Joseph Sawyer, of 63, Chancery-lane, architect, from entering upon or proceeding with an arbitration on the 16th inst. or upon any other arbitration in respect of a contract made between the plaintiffs and the defendants, dated November 1890, be reversed and that the injunction asked for by the plaintiffs be granted, or that such other order might be made as might seem just. Mr. Bigham, Q.C., and Mr. Boyle appeared as counsel for the plaintiff, while Mr. Cyril Dodd, Q.C., and Mr. Statham represented the defendants.

After a considerable discussion, both the action and all matters in dispute under the contract were referred to an arbitrator to be appointed by the parties, if they could agree on one, and if they could not agree on one, the arbitrator to be appointed by the Court, the costs of the appeal and the setting aside of the judgment obtained to be costs in the cause.

MEETINGS.

FRIDAY, DECEMBER 20.

Architectural Association.—(1) Mr. J. Toomey on "Brickwork"; (2) Mr. R. Rust on "Woodwork."

7.30 p.m.

Crystal Palace School of Practical Engineering.—Announcement of list of certificates awarded by the examiners. 12 noon.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

21,734.—**CEMENTS:** E. Weekwarth and another.—An improved floury mixture, or dry cement, for making stucco work, having a smooth surface, consisting of aluminous, potash, lime, potash-alum and borax, combined with plaster of paris, in suitable proportions.

21,745.—**SURVEYING INSTRUMENTS:** D. Aramborn.—An instrument for measuring distances, plotting, grading, &c. The instrument is mounted on wheels, and consists of two recording discs or plates, each having a separate independent shaft, turning on suitable bearings, and a endless screw placed between the discs, with a nut adapted to move on the screw, and provided with opposite styles to record lines on the opposite discs, and an eccentric and cog-wheel mechanism connecting the axle of one set of wheels and said screw, whereby the nut carrying the styles is carried to and fro on its screw. A platform is mounted on the axle of the front wheels, on which is fixed a pointer, in connection with a pivoted tongue. On the direction of this tongue being changed the motion is communicated to one of the discs by means of a vertical shaft and cog-wheels, marking the corresponding angle on said disc.

471.—**SAW GUARD:** G. Parkington.—Relates to a guard for circular-saws, consisting of wise-work or other open

LONDON.—For the supply and fixing of ten new boilers at the Cresswell outfall, for the London County Council.—
T. & W. Balfour £79 17 7 Sperry, Inman, & Co.
J. Thompson 75 0 0 Lid. £6,797 0 0
Kiley Bros. 74 4 0 W. R. Renshaw 6,730 0 0
Oldham Boiler Works Co.
Co. Ltd. 71 9 0 Leeds and Bradford
W. Wilson & Co. 71 4 0 Boiler Co. Ltd. 5,476 0 0
John Whitehouse 6 15 0 Yates & Thom 5,717 0 0
Daniel Adamson & Co. 6 12 0 Fraser & Son 5,716 0 0
H. & T. Danke Ltd. 5,720 0 0
Tetter Bros. 5,734 0 0
Lid. 5,735 0 0
E. Drake 5,735 0 0
Taylor & Sons 6,447 0 0
Accepted. The lowest tenderer did not fill in the schedule of prices for variations in the work, nor the schedule as to rates of wages and hours of labour.

LONDON.—For erecting a manual training centre in connexion with the Lyham-road School, Brixton, and for other work, for the School Board for London. Mr. T. J. Bailey, Architect.—
W. Downes £1,495 0 0 J. & C. Hower £1,335 0 0
Holliday & Green 1,456 0 0 Peacock Bros. 1,286 11 0
Wood 1,456 0 0 Peacock Bros. 1,286 11 0
Whitehead & Co. 1,443 0 0 E. Tiggs, The
W. Akers & Co. 1,459 0 0 Chase, Chatham 1,273 12 6
Recommended for acceptance by the Works Committee.

LONDON.—For carrying out various improvements to the Infants' department of the Vauxhall-road School, Lambeth, for the School Board for London. Mr. T. J. Bailey, Architect.—
W. & H. Castle £197 0 0 Rice & Son £197 0 0
W. Downes 197 0 0 C. Chalkley 197 0 0
Holliday & Greenwood 197 0 0 B. E. Nightingale 180 10 0
W. V. Good 197 0 0 Maxwell Bros. Ltd. 180 10 0
J. Marland 197 0 0 Britton-road 180 10 0
Recommended for acceptance by the Works Committee.

LONDON.—For providing additional heating surface to improve the efficiency of the hot-water apparatus at the Ivydale-road School, Nunhead, for the School Board for London.—
J. E. Clarke & Sons £775 0 0 W. Wrentham, Gray, &
J. Fraser & Son 850 0 0 Co. Finsbury pave.
Russell & Co. 150 10 0 men £193 0 0
J. C. & J. S. Ellis Ltd. 117 8 7 W. C. Chubb & Sons 117 8 7
Recommended for acceptance by the Works Committee.

LONDON.—For carrying out various sanitary structural alterations and improvements to the Bowling Green-lane School, Clerkenwell, for the School Board for London. Mr. T. J. Bailey, Architect.—
C. Coates £1,036 10 0 R. A. Yerbury & Sons £1,330 0 0
C. Deering & Son 1,198 0 0 C. Miranda & Sons
Staines & Son 1,187 0 0 Catherine House, Trinity
L. H. & R. Roberts 1,282 0 0 square 1,630 0 0
Recommended for acceptance by the Works Committee.

LONDON.—The London School Board, on the 5th inst., agreed to accept the tender of Mr. D. Charteris, Westminster, amounting to £2,451, for carrying out the alterations and improvements in connexion with the Salter's-hill School, West Norwood, for re-fixing the girls and infants covered playground, providing additional water-closets for the laundry centre, and also for enclosing, draining, and tarpaving the additional land acquired by the Board. The Committee have since received a letter from Mr. Charteris, regretting that a clerical error has been made in his tender for this work, and asking, under the circumstances, to be relieved from the contract. The Committee accordingly recommended the acceptance of the second lowest tender, that of Mr. E. Tiggs, amounting to £2,451.

LONDON.—For structural alterations in connexion with the Infants' department of the York-road School, King's Cross, for the School Board for London. Mr. T. J. Bailey, Architect.—
C. Deering & Son £330 0 0 T. Currey £210 0 0
McCormick & Sons 225 0 0 Stevens Bros. 212 10 0
W. T. Ballard 222 5 0 F. Britton, Highbury 222 0 0
Recommended for acceptance by the Works Committee.

LONDON.—For providing a new corridor and additional cloak accommodation, &c., in the Boys' department of the Ricardo street School, Poplar, for the School Board for London. Mr. T. J. Bailey, Architect.—
T. H. Jackson £197 0 0 D. Gibb & Co. £145 0 0
J. Kybett 192 10 0 F. Holliday 145 0 0
C. Barker 156 0 0 T. White & Son, Bow 145 0 0
J. T. Robey 174 0 0
Recommended for acceptance by the Works Committee.

LONDON.—For providing additional heating surface to improve the efficiency of the existing low-pressure hot-water apparatus at the Latchmere School, Battersea Park-road, for the School Board for London.—
J. & F. May £161 0 0 Purcell & Nohs £143 0 0
C. Davis 160 0 0 I. F. Clarke & Sons 143 0 0
J. C. & J. S. Ellis Ltd. 129 10 0 I. Fraser & Son 143 0 0
J. Wrentham-Smith, Gray, Duffield & Co., Slough 119 0 0
Co. 151 30 0
Recommended for acceptance by the Works Committee.

LONDON.—For providing a new boiler, and for additional heating surface at class rooms of the St. Dunstan's-road School, Hammer-smith, for the School Board for London.—
J. Wrentham-Smith, Gray, & W. C. Cannon & Sons £330 0 0
Co. £314 0 0 J. Fraser & Son 245 0 0
J. & F. May 324 0 0 gate-street 220 0 0
C. Davis 295 0 0 gate-street 220 0 0
Recommended for acceptance by the Works Committee.

LONDON.—For providing and fixing four sliding glass partitions in the Boys' and Girls' departments of the Wolvestey-street School, Bethnal Green, for the School Board for London.—
C. Munday & Sons £197 0 0 W. Martin £197 0 0
D. Gibb & Co. 197 0 0 T. White & Son, Bow 265 0 0
Staines & Son 197 0 0
Recommended for acceptance by the Works Committee.

LONDON.—For extending the present system of low-pressure hot-water apparatus in the new school to the enlargement of the Fair-street School, Hoxleydown, and also for providing and fixing a Trencham boiler, for the School Board for London.—
Maguire & Son £238 10 0 I. F. May £461 0 0
J. Wrentham-Smith, Gray, & Co. 225 0 0 J. F. Clarke & Sons 461 0 0
W. C. Cannon & Sons 225 0 0 Moorgate-st. E.C. 461 0 0
Recommended for acceptance by the Works Committee.

LONDON.—For enclosing, draining, and tarpaving the additional land which has been acquired in connexion with the "Foster" School, Lower Holloway, and for erecting a new laundry-well and building buttresses to the adjoining houses, for the School Board for London.—
Marchant & Hirst £567 0 0 F. Britton £515 15 0
Dove Bros. 554 0 0 G. Kirby 509 0 0
H. Knight & Son 555 0 0 Stevens Bros. 509 0 0
W. T. Ballard 555 0 0 Park 509 0 0
J. Grover & Son 520 0 0
Recommended for acceptance by the Works Committee.

LONDON.—For providing and fixing a complete system of low-pressure hot-water apparatus for warming the junior mixed department in connexion with the Gipsy road School, West Norwood, for the School Board for London. Mr. T. J. Bailey, Architect.—
J. C. & J. S. Ellis £135 0 0 J. Wrentham-Smith, Gray, &
I. & F. May 999 0 0 Co. £135 0 0
Purcell & Nohs 999 0 0 Vaughan & Brown 135 0 0
W. C. Cannon & Sons 203 0 0 Kirby street, E.C. 280 0 0
Recommended for acceptance by the Works Committee.

LONDON.—For erecting a combined cookery and laundry centre in connexion with the Haslemere-road School, Lower Sydenham, and for other work, for the School Board for London. Mr. T. J. Bailey, Architect.—
W. King & Son £1,969 0 0 J. Smith & Sons £1,600 0 0
E. Procter 1,969 0 0 B. Triggs 1,598 0 0
Garrett & Son 1,747 0 0 J. C. Bower 1,593 0 0
W. D. Akers & Co. 1,747 0 0 J. C. Bower 1,593 0 0
J. Oway 1,747 0 0 Norwood 1,593 0 0
C. D. Meier & Son 1,747 0 0 Mid-Rent Building and
A. Black & Son 1,747 0 0 Contracting Wks. Ltd. 1,750 0 0
Recommended for acceptance by the Works Committee.

LONDON.—For providing additional accommodation in connexion with the Hackney Divisional Offices, on the site in Homerton-terrace, for the School Board for London. Mr. T. J. Bailey, Architect.—
H. Knight & Son £1,969 0 0 Vernall, Dames, & Co. £1,598 0 0
W. Greger & Son 1,747 0 0 T. White & Son 1,468 0 0
C. Deering & Son 1,747 0 0 D. Charteris 1,447 0 0
J. Grover & Son 1,688 0 0 W. Shumway, Upper
C. Cox 1,665 0 0 Clapton 1,395 0 0
McCormick & Sons 1,591 0 0
Recommended for acceptance by the Works Committee.

NEWHAVEN (Sussex).—For alterations to No. 23, High-street, for Messrs. Kealey & Tongue Mr. W. Cooper, architect and surveyor, 21, Havelock-road, Hastings.—
Card & Co. £260 0 0 W. Woolger, Newhaven 430 0 0
Accepted.

NEWMILNS (Ayrshire, Scotland).—For the erection of Town Hall, Mr. Andrew Harrison, architect, Queen Chambers, Colmore-row, Birmingham. Quantities by Mr. Anthony Kew, 3, Newhall-street, Birmingham.—
Robert Anderson £3,299 0 0 M. Muir & Co., Kilmar-
Robert Anderson 3,299 0 0 nock £2,699 0 0
Accepted.

PAIRICR (T. James).—For the erection of stabling house, &c., for the Corporation. Mr. A. C. Tarley, C.E., Borough Engineer, Town Hall, Eccles.—
James Byrom £2,532 5 1 Chapman & Holland
Thos. Moore & Sons 6,188 0 0 worth £5,775 0 0
Frank Colson 6,179 14 0 Ed. Henthorne 5,750 14 0
Samuel Warburton 6,221 12 11 N. Brooks & Son 5,750 14 0
James Roper 5,840 0 0 Patricrone 5,750 14 0
[Borough Engineer's estimate, £5,800.]
Accepted.

ROEHAMPTON.—For erecting Holy Trinity Church, Roehampton, S.W. Mr. Geo. H. Fellows Pyne, architect, 6, Queen Anne's-gate, Westminster. Quantities by Mr. Henry Hale, F.S.I., surveyor, 33, Old Queen street, Westminster, S.W.—
P. Nightingale £14,175 0 0 Channel-screen and
D. Charteris 12,330 0 0 Baptistry included.
Kirk & Randall 12,330 0 0
W. Downes 12,330 0 0
Lawrence & Sons 12,330 0 0
P. Wright 12,330 0 0
J. & C. Bower 12,330 0 0
Stimpson & Co. 12,330 0 0
Dove Bros. 12,330 0 0
Adamson & Sons 12,330 0 0
W. J. Mitchell 12,330 0 0
Holloway Bros. 12,330 0 0
Holliday & Greenwood 12,330 0 0
Goddard & Sons 12,330 0 0
A. Porter 12,330 0 0
Conditionally accepted.

SEAFORD (Sussex).—For the erection of baker's premises in Chichester-road, for Mr. R. Lambie, Mr. Wm. Cooper, architect and surveyor, 21, Havelock-road, Hastings.—
H. E. Crittenden £1,184 0 0 C. Marling £804 0 0
Fulham & Hutchinson 1,184 0 0 F. D. Foote, Hastings 804 0 0
F. H. Berry 953 0 0
Accepted.

SUTTON-IN-ASHFIELD (Nottingham).—For the construction of settling-tanks, &c., in connexion with sewage scheme, for the Urban Sanitary Council. Mr. McW. Bishop, Town Surveyor, Council Offices, Outram-street, Sutton-in-Ashfield. Quantities by Messrs. Attewell & Green, &c.—
Attewell & Green £2,830 0 0 J. H. Vickers £2,070 0 0
J. F. Price 2,830 0 0 A. Jenkins 2,070 0 0
D. Smart 2,830 0 0 J. Lane & Co. 2,070 0 0
C. Raine 2,830 0 0 Skegby 1,997 10 0
W. E. Shaw 2,830 0 0
Accepted.

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The Builder.

OL. LXIX. No. 2760.

DECEMBER 26, 1895.

ILLUSTRATIONS.

Stained Glass Window of Chapel, Emanuel School, Wandsworth Common.—Designed by Mr. F. Hamilton-Jackson	Double-Page Ink-Photo.
"Philiphaugh," Selkirk.—Mr. W. Wallace, Architect	Double-Page Ink-Photo.
Competition Design, Hampstead Central Public Library.—By Mr. Horace Field, Architect	Double-Page Photo-Litho.
House at Lowestoft.—Mr. A. C. Blomfield, Architect	Single-Page Ink-Photo.
Electric Light Engine-house, Wickham Hall, Kent.—Mr. W. Millard, Architect	Single-Page Ink-Photo.

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Drawing in Elementary Schools.



THE Department of Science and Art has done well in issuing, for the first time we believe, an illustrated syllabus of the course of drawing organised by it for instruction in elementary schools.

The principal value of such an illustrated syllabus is that it enables those of the outside public who are interested in the subject to understand better what is being done in this most important branch of elementary education. The necessary guidance for the teachers could be and probably is supplemented by more complete instructions; but the illustrations given in this syllabus put it in the power of all to obtain, at the cost of 4½d., an authoritative illustration of the official method of teaching drawing.

In a period of not much more than a generation we have seen a vast change in the ideas as to first education in drawing, both at home and in schools. The older ones among us can remember the time when Harding's "First," "Second," &c., drawing-books were the foundation for acquiring a knowledge of drawing; books in which the whole object was to produce picturesque effect and to acquire a picturesque touch; when everything selected to be drawn must be broken and dilapidated, the "first book" commencing with such examples as an old mile-stone, a broken stile, and such objects, shaded in lithograph. The next book would go on to more ambitious subjects—a bit of an old-thatched cottage with a pent-house porch over the door, a broom leaning against the wall, and a half-open window with the stirring incident of a jug on the window-sill showing up white against the darkness of the interior. Thus were put together the component elements in picturesque landscape sketching, and by the time the student got to the Fourth drawing-book he had risen to the copying of a whole lithographed landscape. The character of these little sketches was often admirable of its kind; but unfortunately the study of them, though possibly more interesting to the beginner than the present methods, did not teach drawing. It is only

since a comparatively recent date that it has been generally recognised in schools and by "certificated" teachers that the first object in teaching drawing was to train the pupil to a steady command of the pencil and to a clear sense of line and proportion; and whatever faults may be urged against the "Department" system in its more advanced stages of art-training, it is only right to acknowledge that it is to its influence that we mainly owe the revolution in the preliminary teaching of drawing, which has consisted in substituting a specific training of the hand and eye for the old unsystematised practice of teaching children to sketch ragged objects in ragged lines, before they had even learned to draw a straight line or a curve with firmness and accuracy.

The syllabus is divided into three sections. The first gives the course of drawing in Elementary Schools and the schedule of subjects for examination. The second division is a scheme of instruction in drawing for small schools. The third is an alternative syllabus of instruction for elementary schools, to be used if preferred, and which differs in very important points from that laid down in the first section.

This first section, divided into seven standards, commences by setting the pupil to draw "freehand, and with the ruler," simple straight lines, crossing lines at certain angles, squares and continuations of squares. We do not quite understand the philosophy of doing these both freehand and with ruler; if the two are employed together it would seem to us that the ruler should come first, but the order of the wording seems to imply the contrary. We need not occupy our space with describing the standards categorically; they proceed from this onward to freehand drawing from the flat, drawings from simple models or everyday objects; and a note to the schedule makes the sensible remark that in order to interest the scholars in their work it is advisable to teach them to draw as early as possible from such common objects as are easily available. There is an exception made as to girls which seems unnecessary and unwise; they are not required to take the subjects specified in Standard VI. (c) or in Standard VII. (d) or (e). The first is "geometrical drawing more advanced than in Standard V.," the second "geometrical drawing more advanced than in Standard VI.," and the third is

"plans and elevations of plane figures and rectangular solids in simple positions, with sections." These portions of the standards all deal with elementary geometrical problems—"to bisect a given angle," "to construct a triangle from a statement of one or more of its sides and angles," &c. Why should girls be debarred, any more than boys, from acquiring this degree of geometrical knowledge? It would be excellent training for their minds in any case; and in the present tendency to seek to enlarge the field of occupations open to women it is impossible to say that such training would not be of use to them in taking up some occupation in connexion with the arts or sciences for which they may have a talent, or in which they may find an opening. There is a point no doubt at which the education of the two sexes naturally divides into separate lines; but it is a point which is getting pushed later and later in their lives, and which in the present day can hardly be said to be definitely reached until the time when the future occupation of the boy or girl has been settled or can be foreseen with some probability. To make the break in what, even in its higher standards, is only elementary drawing, is a stationary, if not a retrograde policy. As to the examples of freehand drawing given, they seem to meet the case very well, and afford training to the hand and eye in a variety of lines and objects. We only complain that the specimens of shaded objects for Standard VII. (c), given on page 13, are poor things; the one at the bottom of the page looks like a bad imitation of Greek work. It is important that decorative objects set as copies should be such as to train the taste as well as the hand. Standard IV. deals with drawing things to scale, either by the eye (enlarging an object proportionately to three times the scale) or by actual use of the scale. There is no division here suggested between boys and girls, yet the reasons which prompted the division in Standard VI. and VII. might have been supposed to be equally applicable here. Drawing to scale is a useful acquirement for a girl, simple geometrical drawing should be equally so. We expect that these discriminations between the teaching of the two sexes will be abandoned in a future elementary programme, at no very distant date.

Section B.II. is merely a system of grouping the scholars in small schools where the

average attendance does not exceed 60, and where the scholars may be divided in a junior and senior group, with two parallel lines of instruction adapted to their several capacities, and compressing the requirements of the usual seven standards into two. It is in fact a simplification of the system of Section I. for special cases.

The third section is on somewhat different lines from the syllabus hitherto in use, and is not intended to supersede it, but to be used as an alternative system for those who prefer it. It is however radically different at the outset, and seems to have been drawn up as a kind of concession to a feeling which has been rather prominent of late among educationalists (if we may coin the word), that elementary drawing should have for its object not merely training in drawing but training in the mechanism of the body, or the use of it; possibly also those who drew it up have been partly influenced by the attention which has been directed of late years to Japanese methods of drawing, with the sweep of the arm rather than of the hand. Instead of commencing with the drawing of straight lines and geometric figures, this alternative section commences with the drawing of complete curves, mostly ellipses, drawn at arm's length and with free action from the shoulder. A quotation as to the intention of this is given from the Education Department Circular No. 322 (February 6, 1893), to the effect that the teacher should aim at "the harmonious and complete development of a child's whole faculties," and should pay especial regard to the love of movement, which can alone produce healthy physical conditions. A page is given of first specimens, not as copies, but as examples of what children may be made to draw on this system; commencing with a simple ellipse drawn at arm's length, then to colloccations of ellipses in such a manner as to produce a simple decorative result. This is excellent practice both for the eye and for the body; the instructions being that the ellipse should be repeated in different directions, to give control of direction, without turning the paper or changing the attitude. This is perhaps not exactly learning drawing in the strict sense; on the other hand it may be replied that it is learning something more than drawing at the same time, and something quite as good for the child; and at all events it is a far more genuine piece of training for hand and eye than that foolish drawing round the outlines of shillings and sixpences, which Mr. Ruskin and Mr. Leland have recommended as preliminary teaching in drawing. Other examples follow, with the application of this acquired power of drawing elliptical curves to simple objects in which such curves occur. Whether we should quite approve of elementary decorative outlines of birds, fish, &c., being produced by this means is another matter; to our thinking it is more desirable that learners should draw the genuine outline of birds and animals in the first instance, when they come to drawing them at all, and learn them aright, and learn to conventionalise afterwards; to begin with conventional representations of living things seems beginning at the wrong end, and starting the learner with false ideas as to natural form. Brush-work, after the manner of the Greek so-called honey-suckle ornament, is also introduced in this course, commencing with the simplest attempt at a symmetrical "dab" with the brush, proceeding subsequently to the grouping of brushmarks in decorative combinations. Drawing from memory is also introduced in this section. This is a very useful training to the mind and the faculty of perception, but in the case of beginners or young pupils it should always, we think, be preceded by the drawing of the same object from sight, so as to learn all about it on the spot, otherwise the memory-drawing may only promote a loose habit of drawing; we gather from the wording of the instructions that this was not intended to be specially in-

sisted on. There is no reason either why memory-drawing should be made a part of the "alternative" scheme and entirely ignored in the normal scheme (Section I.); the latter includes drawing objects both from the flat and from the round, and memory-drawing could be just as well applied to those as to anything contemplated in Section III. Nor is there anything to prevent the normal scheme and alternative scheme being used conjointly, if the teacher wishes and if there is time for it.

On the whole, though some of the examples given as typical specimens of copies for study are certainly not all that one could wish, the general scheme as illustrated here seems fairly calculated to ensure that children with ordinary attention and care will learn by its means that power of handling the pencil, and of clearly appreciating form and proportion in objects, which has now at last been recognised to be such an important element in general education.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND

By PROFESSOR BALDWIN BROWN.

VIII.—Roman or Romanesque? Summary.

EVERY discussion on pre-Conquest architecture must have for one of its ultimate objects the establishment of something like a chronological sequence among the various types and styles of work represented in the monuments. A comparative study of plans has already enabled us to decide with tolerable certainty that cruciform churches cannot be prior to the tenth century, and that the earliest towers would probably make their appearance about the same time. Examining the monuments from the point of view of their structure and technique, we have inquired how far they show traces of Roman or Celtic influence, or seem to have been affected by the traditional methods of timber construction familiar to their builders. The following represents the outcome of these inquiries: (1) Except in the case of the basilican churches the proportions of the buildings are not Classical; the technique is not Roman; the only features that are avowedly Roman are the round arches and the plastering; the baluster-shafts and the peculiar bond called "long-and-short work" are probably ultimately Classical. (2) The square ends of the churches agree with Celtic practice, and may be derived from this source; the sloping jambs and the square-headed openings are decidedly of Celtic derivation; the steep slope of the gables points to the same influence. (3) Timber tradition practically counts for nothing in the stone churches. To these results it must be added that the remarkable height of the side-walls is not either Roman or Irish, but occurs on the Continent under circumstances suggesting that it was a means of protection against heathen assaults; that the extreme length of the naves in proportion to their width is not noticeable elsewhere, and may be claimed for the moment as a native Saxon feature.

If the above analysis—though put for convenience sake very shortly—is substantially correct, we may ask, How do the results of it help us in the matter of chronology? and to this the disappointing answer must be given that they do not help us at all, save in two points only: (1) the "long-and-short" quoining, which seems a late feature, and (2) the disproportionate length of the nave. The three longest churches known, Monkwearmouth, Jarrow, and Escomb, seem on other grounds to be among the earliest examples, and this length may, accordingly, be accepted as a criterion of date. All the other features, such as sloping jambs, baluster-shafts, and high walls and gables, occur late as well as early, while the technique of the masonry seems to vary from example to example, and district to district, but not from age to age.

One branch of inquiry now remains. We

have to carry the comparative method from the consideration of plans and fabrics to that of ornamental details, and to ask how far Saxon mouldings, carvings, shafts, capitals, and similar features, can be fixed in time by a comparison with what is found in more or less datable buildings elsewhere in Europe. There arises at the outset the question—Roman or Romanesque? The history of the details and decorative features of Christian churches is parallel to that of their plans and construction. Almost every feature that we find in use in the Romanesque era actually had its origin in Roman work, but, instead of all these features continuing in vogue through the Early Christian and Early Medieval periods, they seem to drop out of use altogether, and when they reappear it is rather as new creations than as revivals. This is the case, for example, with the cubical capital, which occurs in Early Byzantine work, but is hardly known elsewhere till it comes into prominence as a characteristic feature of German Romanesque in the eleventh century. The twisted column is Classical but yet characteristically Romanesque. The same may be said of the more important features, the angle-shaft and the roll-moulding, which in Romanesque recessed openings so constantly go together. The roll-moulding is Classical and occurs abundantly enough on Roman altars and tombstones, yet its real place as a predominant enrichment is in Medieval and not Antique architecture. The angle-shaft occurs in a prominent position on the façade of the Palace of Theoderic at Ravenna of about 500 A.D., and, doubtless from a Byzantine source, in the Mosque of Toulun at Cairo of A.D. 877. Its use, however, all through the Early Medieval period is merely sporadic, while in the advanced schools of Romanesque it becomes one of the most familiar features. The appearance of any of these forms in pre-Conquest architecture may mean that the Saxon builder employed a Roman or Early Christian motive which in the rest of Europe had been suffered to go out of use. It is infinitely more probable, however, that its use in England is contemporary with, or a little posterior to, its emergence into general favour on the Continent. "Romanesque rather than Roman," is the answer we should have to give in most cases to the inquiry noticed above, and this applies also to some other forms in regard to which the contrary reply would seem the most natural one to give. There are many imposts of Saxon tower or chancel arches that remind us at once of the mouldings on Roman monuments, and would naturally suggest an early date for the buildings in which they occur. A similar inference might, however, be drawn with almost equal justice about much of the linear ornamentation of the Normans, which we know as a fact was not in use before the eleventh century. The stars and zigzags, with which we are all so familiar, are almost exact reproductions of devices we find on ancient Roman stones, like the fine altar discovered not long ago at Lanchester, in Durham. The fact is that Roman monuments remained conspicuously in evidence throughout the Early Medieval period, and were open to any one who desired to appropriate or to imitate them. Such appropriation or copying might be done at any time, and is, in itself, no valid criterion of date. A feature, therefore, that occurs both in Roman work and Romanesque may in the nature of things be early or late, but there should be little hesitation in consigning a comparatively late date to angle-shafts and large roll-mouldings, such as occur at Wittering (fig. 45), Bosham (fig. 46), Stow, or St. Benet's, Cambridge. The same would be said with confidence about pilaster-strips and wall-arcading, did not the latter occur in the remarkable Saxon chapel at Bradford-on-Avon, that is generally reckoned an early example. Here we find on the outer faces of the walls, in a lower story a division by upright pilaster-strips, and above, cut out in low relief on the surface of the stonework, an arcading, in

which pilasters with bases and caps are joined by a series of round arches, after a neat and tasteful pattern. Now this arcading, if Romanesque, plain as it is, would not be pronounced rude or early, and would certainly agree better with the style of the eleventh century than

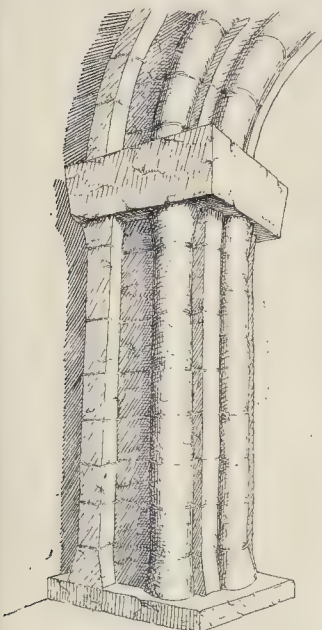


Fig. 45.—Chancel Arch, Witterling, Northamptonshire.

of the tenth. The same would be said of the masonry, the fine jointing of which seemed to Sir J. H. Parker like work of the twelfth century. Why not therefore, it will be said, assign it its date in the late period of the style to which these features seem to point? That we are not ready to do this is



Fig. 46.—North Pier of Chancel Arch, Bosham, Sussex.

due to the fact that other features of the building seem just as characteristically early. In plan, in proportions, and in the width of its chancel arch, it is very unlike the later type of Saxon churches. The north and south porches, of such large proportionate size, remind us of St. Pancras, Monkwearmouth, and Corbridge, rather than of anything of later date. They seem to be

examples of the "Porticus," so often mentioned in connexion with churches in early Saxon records, the ecclesiastical use of which is not clearly known. Though the nave of the chapel is not of disproportionate length—it measures about 25 by 13 ft.—the height of the walls is extraordinary. They are nearly twice as high as the chapel is broad, a proportion never reached elsewhere, and though lofty naves, as we have seen, occur late in the style, the general tendency of proportions in the epoch of advancing Romanesque was towards the breadth and lowness that characterise the Norman style, and which are conspicuous in the late chapel at Deerhurst. The chancel arch is, however, the feature most difficult to reconcile with a late epoch. In a notice of early Celtic churches, in his "Scotland in Early Christian Times," p. 64, Dr. Joseph Anderson remarks about some primitive examples in the North of Scotland, that "no earlier type of chancel entrance is likely to be found than one which . . . is not differentiated in any feature of size, construction, form, or ornament, from the external doorway." These words might almost have been written about Bradford, where the chancel arch is only 3 ft. 4 in. across, and is only a little wider and more ornate than the doorways. It is difficult to believe such a chancel opening could belong to an advanced period of pre-Conquest architecture. The date of Bradford-on-Avon, and with it the age of decorative arcading on Saxon churches, must, therefore, for the moment remain undetermined. Where such arcading occurs on towers, it is, of course, never of early date.

The results of the considerations advanced in the preceding papers of this brief series may seem meagre and unsatisfactory; but, in the present state of knowledge on the subjects dealt with, it has seemed better frankly to confess a doubt where uncertainty exists, than to attempt to fit all the facts to some pre-conceived theory. If there are still some who would go back to the old position that there are no Saxon stone buildings which can be proved earlier than the eleventh century, such must be reminded that the crypts of Wilfrid still exist at Hexham and at Ripon, and that his church at the former place lasted till it was burned down at the end of the thirteenth century. The workmanship of those crypts is not so unlike what we see at Corbridge and Escomb, and other sites in the North, that we find it hard to accept an almost equally early date for these and similar churches. Did nothing certain exist from this early period we should feel somewhat differently, but about the age of these remarkable crypts there can be no reasonable doubt; and they establish a probability in favour of the churches to which great weight must be allowed. Resting on this abstract probability, we may here offer a tentative chronology of some of the more complete or more remarkable of the Saxon churches, based on their architectural features only. In regard to many of these buildings, there exists a certain amount of literary material which must be taken into due account in fixing their dates. It cannot, however, be properly employed, except after critical sifting and discussion, for which there has been in these papers no opportunity. The difficulty nearly always arises, in the case of literary notices, that we are not sure that the buildings mentioned therein are those of which we have existing remains. The instance of Deerhurst contains a warning. An inscription had long been known, which describes the erection of an ecclesiastical building at that place in the time of Edward the Confessor. As Deerhurst Church was obviously Saxon, the inscription was supposed to refer to it, and its date was thereby held to be fixed. It is now seen, however, that the inscription does not refer to the church at all, but to another Saxon building the existence of which at Deerhurst had, till the other day, been unsuspected. In the case of Bradford-on-Avon, William of Malmesbury gives us a notice which would prove

conclusively the early origin of the building, were we sure that the "ecclesiola" of which he writes is the same structure as the one we know. On the other hand, we can be certain, from topographical indications, that the Medieval notice we possess of St. Pancras, Canterbury, refers to the existing remains near the Kent and Canterbury Hospital, while continuous tradition in the case of St. Martin's, at Canterbury, and the same (coupled with Early Norman work in the chancel arch) in that of Monkwearmouth, renders the current identification of these buildings indubitable.

Nor, again, has account been taken in these "Notes" of the occurrence of carved and inscribed stones in connexion with the buildings referred to. This class of evidence has its value, but like that derived from literary sources it must be used with due caution. Independently, however, of any light that can be derived from these two quarters, it is something gained to know what the purely architectural evidence gives us, and this appears to be the following. The basilican churches, about the age of which there is not so much doubt, may be left out of consideration, and the enumeration that follows refers only to the buildings on what we may call for brevity the Celtic plan.

Escomb heads the list of these, for it possesses every feature that we have seen reason to believe makes for age, and none that suggests a later date, save that the fact that it is not mentioned by Bede seems to place it after his time. Monkwearmouth and Jarrow would stand in the same category, but we cannot escape from the puzzling fact that although *ex hypothesi* erected by Benedict Biscop, they show—in form and technique, at any rate—no traces of that "Roman" or "Gallic" style which we should naturally look for. We can only remove this undoubted difficulty by the supposition that what the foreign craftsmen really paid attention to was the decoration and fitting up of the church, the fabric of which they built, or suffered to be built, in the style already established by the earlier Celtic missionaries. Bradford-on-Avon has been admitted to be a point of uncertainty; but in the meantime we may be justified in dwelling more on the early features just discussed, than upon the apparently late arcading and the fluted pilasters. Apart from some other possibly very early examples in the North, it would be rash to suggest any additions to this list of churches prior to the Danish invasions, though some existing fabrics with high and narrow Saxon naves, such as St. Nicholas, Leicester, may go back to an early date. Corhampton, though it may be on a site consecrated by the preaching of Wilfrid, is marked out by its pilaster strips, and especially its north doorway, as being at least of the tenth century; while the enigmatical Britford has too wide a nave to be very early. The great towers, Earl's Barton, Barton-on-Humber, Barnack, Clapham, Wickham, and the numerous examples in Lincolnshire and on Tyneside, do not seem to possess any general features which would place them in the tenth rather than in the eleventh century. Finally, it is clear that wherever mouldings show considerable effort after effect, with an evident approach to Romanesque forms, it is the latter rather than the former date that should be preferred. Thus Bosham (in spite of its early associations, Witterling, St. Benet's, Cambridge, Stow, Worth, Norton, Deerhurst, Wootton-Wawen, would all fall in the later period of the style, and probably belong to the times of Canute or of Edward.

The above, as has already been explained, is tentative, and can only be of value in view of further investigations. The methods of study which will probably produce the best results in the future are the statistical and the comparative methods. The individual monuments have been pretty carefully explored, and we can hardly hope for

many more such new discoveries as those of Escomb, Bradford-on-Avon, and Earl Odda's chapel at Deerhurst. Portions of pre-Conquest masonry may, however, come to light in many quarters where the presence of such is now unsuspected, and any old village church, the nave of which is high and narrow, may be found to have as its kernel a single-aisled Saxon oratory.

What we require now is an accessible list of the known examples of Saxon buildings, which should be widely disseminated and encourage study in every part of the country. Such a list, with technical notes and drawings, all excellent as far as they went, appeared in every edition of "Rickman," until the last and current edition, in which, with excellent intentions but a deplorable result, it has been omitted. The consequence of this omission has been, that the one standard book on English Architecture as a whole, contains, as at present read by students, no notice at all of this extremely interesting period, which they are thus encouraged ever afterwards to ignore. The result may be judged from the fact that a work of the pretension of the new illustrated edition of Green's "Short History of the English People" could be issued to the public in 1892 with the amazing statement (vol. i., p. x.) that "the primitive Romanesque architecture of England before the coming of the Normans is now represented only by the little church at Bradford and by a few church towers!"

The first desideratum is an amended list, brought up to date and accompanied by measurements and by drawings of mouldings and similar features. A process of comparison could then be set on foot, not only among the monuments in question themselves, but between these and examples on the Continent. It is hardly too much to say that it is not in England that early English monuments can now best be studied. A patient search in those districts of France and Germany which are likely to have been most in touch with Saxon Britain, will bring to light parallels to many features which, as we find them on this side of the Channel, are unique, and therefore unintelligible. The plan of Wooten-Wawen, for instance, is unique among our known pre-Conquest churches, but there are examples in Germany of a tower over the choir with a sanctuary beyond, which seems to be the scheme of the Warwickshire edifice. An elucidation of Britford will probably be found in the same manner. If some of our local investigators, now pretty numerous, who are enthusiastic about Saxon churches, will spend their holidays on the Continent in exploring the village churches of likely districts across the Channel, the difficulties that still beset the study of this architectural period will soon be in a fair way of removal. That it is worthy of systematic treatment few will deny. Saxon buildings may not be artistically inspiring to the practitioner of to-day; they may not exhibit consistency in style, or present any clear picture of the evolution of architectural forms, yet they are instinct with a certain rude life and energy of their own, which are not without fascination for the student. One would say that the Saxon builders of the first half of the eleventh century bade fair to evolve a vigorous and independent Romanesque style. As we know their work, it is still in the experimental stage, but a glance at the chancel arches at Wittering and Bosham (figs. 45 and 46), shows that it was at the same time spirited and strong. That work of such promise was never carried out to finished result is due to the Norman Conquest, and it casts a new light on that extraordinary event to know that it completely extinguished the nascent Saxon Romanesque. Except the square ends of the churches it would be difficult to find any characteristically Saxon features taken up into Norman architecture—for the western towers and square towers over crossings occur often enough on the Continent. Norman building in England may differ in certain respects

from Norman building across the Channel, but the divergence is only slightly due to the surviving traditions of Saxondom. With what force must William and his followers have struck their blow, when it checked for a time so entirely the growth of Teutonic culture in a country that, after all, was destined to remain to after ages a Teutonic and not a Norman land!

NOTES.

TWO new museums were opened in Paris last week. One of these was that of the artistic collections of the City, for the present placed in the pavilion of the Champs Elysées, which will however have to be removed before the 1900 Exhibition. The large hall, divided by high partitions into compartments, is occupied from the subbase to the frieze by pictures, rather too crowded and somewhat hurriedly arranged. The collection as a whole is not exactly a model of an art-museum; the visitor is somewhat confused by the number of works of all kinds, from competition sketches and rough models of sculpture up to the last purchases from the Salons. If the scheme for the 1900 Exhibition is finally confirmed by the Government, this provisional gallery will be succeeded by a permanent building on the new avenue which is to lead up to the Invalides. The collection will then, one may hope, be better classified, sketches, &c., separated from finished works, and sculpture provided with a gallery of its own.

THE other museum just formally opened is the beautiful Musée Galliera, designed by M. Ginain, and of which we gave an illustration in our issue of January 6, 1894. The collection is in a very unfinished stage at present; with the exception of the fine tapestries from the Gobelins, Beauvais, and the ateliers of Faubourg St. Marcel, there are at present only a few things—enamels and pewter-work by Charpentier and Desbois, and some marbles, &c. It must be regarded as a museum in course of formation, and in a few years will probably be a very fine collection. But it is surely a singular and unhappy idea to have closed up the three bays opening towards the Square Galliera, under the mere pretext of giving greater wall space for the city tapestries. It is taking away one of the greatest beauties of the exterior design of the building, and nullifying one of the intentions of the architect, which was to present an open loggia towards the fine panorama of the Seine and the Champ de Mars presented from this point. It is to be hoped the "City Fathers" will think better of it, and restore the building to its original condition. What they have done is a kind of barbarism one would not have expected in Paris.

THE Budget for the financial year 1896-1897, which has been put before the Imperial Parliament at Berlin contains, as usual, a number of large items for public works, and it should be remembered that, besides this budget, which concerns the Empire as a whole, the different budgets of the individual States, such as Prussia, Bavaria, Saxony, also include considerable sums under the headings "architecture" and "civil engineering." The total for public works as estimated in the Imperial Budget is over forty-eight and a half million marks, or about 2,430,000*l.* Works under the supervision of the War Office require nearly 1,500,000*l.*, whilst the Navy requires 150,000*l.*, and the Post Office 230,000*l.* The Railway Department this year only requires 300,000*l.*, whilst the German Colonies are apparently to have 50,000*l.* The large items which have of late years so conspicuously figured in the Budget for the North Sea-Baltic Canal, the new Houses of Parliament, and the new Imperial Law Courts at Leipzig are no longer to be found in the estimates, the Canal only requiring

6,000*l.* and the Houses of Parliament 2,300*l.* The new Technical Research Institute, which will require a total of about 100,000*l.*, is however down for 20,000*l.* in 1896-97, and the equestrian statue to Emperor William requires 70,000*l.* on account. The expenditure for the War Office is extraordinary in comparison to the other items, and it is to be regretted that there are no substantial sums for new public buildings of architectural pretensions.

ON Saturday the 14th a good many visitors were invited to inspect the church of All Saints, Norfolk-square, as rebuilt after the fire, under the superintendence of Mr. Ralph Nevill. We gave a short description of what had been done under the heading of "General Building News" in our issue of November 16. Externally the church is very plainly treated in brick-work, with only a little decorative stone-work at the principal entrance. The fabric of the outer walls has been preserved, but faced externally with red brick. The Padouk wood from Burmah, which has been used almost entirely for the internal fittings, looks exceedingly well, and we may congratulate the architect on the excellent though simple design of the seating, both in an artistic and practical sense, the wide seats being sloped from front to back so as to be thoroughly comfortable, rendering cushions superfluous. The electric lighting is carried out after a scheme designed by the architect, single lights being hung by silk cords from the roof at a height of about 12 feet from the floor and covered by opalescent glass shades. The electric lights on standards, taking the place of the usual candles on the altar, have rather a novel effect, and possibly would not be approved of by some of the orthodox. The screen behind the stalls is treated simply but in a manner which is distinctly Renaissance in character; this introduction of Renaissance detail into Gothic churches is an architectural fashion of the day with which we do not entirely sympathise. The treatment of the front or "riser" of the chancel, towards the church, with the same mosaic with which the chancel floor is laid, instead of a stone retaining wall, is a detail worth notice, and has a good effect. It is intended, when funds permit, to erect a terracotta belfry and spire over the unfinished turret at the east end.*

THE first experiment by the Architectural Association in introducing papers by practical artisans at its meetings was so successful that there can hardly be doubt that the plan will be adopted from time to time. In the present case the meeting was in our opinion all the more successful in consequence of what at first seemed a disappointment—the unavoidable failure of the readers of the other papers which had been promised to keep their engagement. The result showed conclusively that a paper on one subject connected with building, by a practical artisan, was quite enough to furnish useful matter for discussion for one evening, and that if the two papers on woodwork and leadwork had been also read, there could not have been time for the proper discussion of any of the subjects. On any future occasion of the same kind it will be better to follow the precedent which was unexpectedly set at last Friday's meeting, and keep to one material or one class of work and discuss it thoroughly; though it might be quite possible, and in some cases advantageous, to have two short papers on the same subject from different points of view—say one treating of the material, the other of the manner of working it.

* We may add that the cost of the whole has been between 6,000*l.* and 7,000*l.*, and the following firms have been concerned in the work: Messrs. Perry & Co., general contractors; the Tanax and Coalville Company (terracotta work); Messrs. Norman & Burt (wooden chancel screen); Messrs. Turpin (marble mosaic); Messrs. De Grelle (the font, of veined marble); Messrs. Thomason (brass lectern, altar-rails, &c.), and Messrs. Sotheby (electric lighting).

ELABORATE measures are now being taken at Vienna in connexion with the Danube floods which annually threaten the lower parts of the city. A special Royal Commission will be regularly called together every autumn to make the necessary preparations for the impending danger, and this Commission has full executive powers in case of a catastrophe. The members of this year's Commission have Freiherr von Kutschera as their President, and Dr. Friebeis as their Vice-President. A number of public bodies are officially represented on the Commission, including the military headquarters, the Royal police, the provincial government, the city council, the city board of works, and the Danube conservators. Vienna is divided into eleven districts for the purposes of the Commission, which has its head office at the Town Hall, where a special telegraph station connects the chief of the executive with its officials at some sixty points along the river, as well as with the whole of the police and fire-brigade stations. The Commission is responsible for maintaining order, and clearing all dangerous structures of their inhabitants. They have to house the homeless and attend to their comfort, and they must attend to any necessary shoring, and instruct the housebreakers to pull down buildings if they think fit. There are over one hundred boats and barges at the disposal of the Commission for life-saving and salvage purposes, and these are manned by a staff of 250 men. The Royal Engineers and the Fire Brigade are at the disposal of the Commission should their services be required. It is well to see the city thus prepared to meet any emergency, and we trust that it will not have to suffer from a repetition of such floods as occurred in 1862 and 1871.

DR. S. MONCKTON COPEMAN'S report to the Local Government Board on an outbreak of enteric fever at Loddon, in the Rural District of Loddon and Clavering, states that the drinking-water is entirely obtained from surface-wells, of which there are from sixty to seventy in the town, in the majority of which the depth of water does not exceed 4 ft. The water of the wells in that part of the town which lies between the Green and the river appears to be of universally bad quality, owing probably, in a large measure, to long-continued contamination of the subsoil in that part of the town most remote from the river. Not only is the quality of the water generally bad, but the quantity is apt to be decidedly insufficient for the wants of the inhabitants, especially in times of drought. "At the time of my visit," says Dr. Copeman, "I was informed that previously to the outbreak of enteric fever, which forms the subject of this report, the water of the so-called 'town-pump,' which is situated almost in the centre of the Green, had been in great request, and persons had been accustomed to resort to it for their water-supply, even though living at some considerable distance from it. This was so, as I was informed, for the reason that the water obtained from this well was believed by the inhabitants to be of specially good quality. Since the first week in May, 1895, however, the town-pump has been chained up for reasons stated later on in this report." The reasons were, that in order to see whether any improvement could be brought about in the quality of the water, the well under this pump was opened out, cleansed, and the water pumped out repeatedly, after which a supply of lime was put into the well. While these operations were in progress a large "soakage" well was discovered at a distance of about five yards from the pump well, and connected by a pipe-drain to the covered gulley into which waste water from the pump was received. This soakage well was apparently between eight and nine feet deep, but on investigation it was found that there existed a further deep of about fifteen feet, which was filled up by black mud, the

bottom of which was, roughly speaking, on a level with the surface water in the pump well. No direct overflow from the soakage well had been provided, so that as neither well was steined it is very probable that a quantity of fluid material found its way through the intervening soil from the soakage well to that in connexion with the town pump—the pump to which the unfortunate inhabitants had resorted for its supposed superior quality.

AN outbreak of diphtheria in the borough of Flint, reported on to the Local Government Board by Dr. Reece, appears to be attributed mainly to reckless disregard of sanitary precautions among the inhabitants; but the Report adds that the pollution of the soil from the ill-constructed privy middens, and the consequent emanations therefrom, may to a certain extent have prepared the way for an outbreak of diphtheria. Among circumstances conducing to a low state of health among the population are, insufficient water-supply from sources not of the purest, and the common complaint of inadequate provision for the removal of excrement, which is effected principally by means of privy middens, there being only some half-dozen water-closets in the town. The middens are as a general rule of large size, sunk below the level of the ground, "uncemented, uncovered, sloppy, and stinking." The Town Council contract for the scavenging of their district, the middens being cleaned out when necessary; the Inspector of Nuisances calling the attention of the contractor to such privies as require emptying, and each midden is required to be cleaned out once in a fortnight or three weeks. This official emptying at stated periods is what we have always said ought to be the rule in such districts, as the inhabitants can never be trusted to see to it regularly themselves. But unfortunately the officials at Flint seem to be equally negligent, and the period of emptying is generally six to ten weeks instead of two to three. "Quis custodiet ipsos custodes?"

THE manner in which daily papers report meetings on technical subjects is amusingly illustrated in the *Daily Chronicle's* report of the last meeting of the Architectural Association. After giving a short résumé of Mr. Toomey's paper, the report concludes—"After some discussion Mr. R. Rust contributed a paper on 'Woodwork,' and he was also heartily thanked at the close." The paper by Mr. Rust had been announced, but, for reasons explained by the Chairman, was not forthcoming; but that is enough for the daily paper reporter, who evidently did not hear the discussion either, which was a very important one.

IT is stated that Lord Carrington, who recently purchased Gwydyr Castle,* has decided to sell his seat in Buckinghamshire. Wycombe Abbey, with its timbered park of about 300 acres, or the sporting estate, extending over 3,000 acres. Wycombe Abbey represents the manor-house of Loakes, which had been demised to the Templars by Robert de Vipont. The manor-house was rebuilt in the reign of James I., and greatly improved by Henry (Petty), Lord Shelburne, who in 1700 had acquired the property. The house underwent further changes, and indeed was practically rebuilt of local stone, for the first Lord Carrington by, it would seem, James Wyatt. The Abbey is included in a list of works attributed to James Wyatt in the "Dictionary of Architecture." The "Beauties of England and Wales" (1801) describes the house as about to be repaired and enlarged by Wyatt, and to be cased with a hard sandstone found in the neighbourhood. These stones, it adds, are dispersed over the ground in single masses, similar to the grey wethers on

Marlborough Downs, but have never before been applied to the purpose of building. The cascade was made by J. Lane, who made also the cascade at Bowood.

THE small quarterly publication of the "Society for Checking the Abuses of Public Advertising," published under the title *A Beautiful World*, contains several papers worth attention in regard to the disfigurement of cities and of nature by the advertiser in his various forms. Sir Martin Conway mentions having seen a great vertical wall of rock on the coast of Sweden, rising straight out of the sea, painted all over in huge white-lettered advertisements of margarine. How far is this kind of barbarism to be allowed to go? The best thing in the number is a sarcastic communication from Mr. Julian Sturgis, supposed to be addressed to the Royal Society of Painters in Water-Colours, and calling on them to make the best of the wider opportunities afforded them by the advertiser. Nature no doubt is getting spoiled, but there is a more cheerful view to be taken:—

"Meet the new state of things with a cheerful mind and a bolder paint-box. If the boards of the advertiser forbid the mere imitation of fields and hills, be yourselves the painters of the boards. Throw yourselves at the feet of the proud leaders of commerce, whose advertisements the awe-struck amateur beholds with flashing and admiring eye from the window of the railway carriage, and beg to be permitted to exercise a bolder and more sweeping brush on those extensive panels. Nor stop at the mere earth. Were not the sails of Venetian fishing-boats made lustrous by painted symbols? A fleet of smacks, and serried ranks of bathing-machines invite you. And behold the generous spaces of the air! Sky-signs, balloons! The spirit fails before the vastness of the possibilities before you, and the immediate rise in the price of paints."

A CORRESPONDENT of the *Times*, writing from Kingston, draws attention to the neglect of the old furniture, tapestry, &c., at Hampton Court, alleging both that it has been injured by visitors for want of proper supervision (he asserts even that bits of tapestried chairs have been surreptitiously cut out as relics and carried off), and that it is deteriorating also for want of proper care in cleaning and a proper staff to look after it. This is a serious matter, for Hampton Court is a unique example of a great suite of rooms of its date, and it may be said that the tapestry and furniture (especially the tapestries in the gallery out of the great hall) are of far more artistic and archaeological value than most of the pictures.

THE ARCHITECTURAL ASSOCIATION: BRICKWORK.

THE ordinary fortnightly meeting of this Association was held on the 20th inst., in the meeting-room of the Royal Institute of British Architects, Mr. W. D. Caroe, M.A., F.S.A., President, in the chair.

The minutes of the previous meeting having been read and confirmed, Messrs. W. J. Devlin and A. Hendy were elected members of the Association.

Mr. Banister F. Fletcher (Hon. Sec.) announced the following donations to the library: "The Builder Album of Royal Academy Architecture, 1895," presented by Mr. H. H. Statham; and three copies of the pamphlet, "Domestic Metal Work," presented by Mr. H. S. S. He proposed a hearty vote of thanks to the donors.

The vote was unanimously accorded.

The President intimated that the following classes were commencing: Materials (Div. II.), Wednesday, January 1, by Professor Kerr; Practical Design, Monday, January 6, by Mr. Beresford Pite; and Elementary Water Colour, Thursday, January 9, by Mr. W. G. B. Lewis. A paper was then read by Mr. J. Toomey on "Brickwork." In the course of his observations Mr. Toomey said:—

It will be easily understood that in a paper of this kind, with a time-limit, scarcely more than the fringe subject-matter can be touched upon. Therefore I will confine myself to materials used by bricklayers, with a few remarks on methods of using them.

* See our "Note" p. 44 ante. Gwydyr had belonged to the Baroness Willoughby de Eresby, whose sister married the second Lord Carrington.

* This was a mistake. It was presented by the proprietors of the *Builder*.—Ed.

Sand.—I have often found that the quality of the sand used for building purposes does not receive the attention it deserves. A clean, sharp, sand is essential to the making of good mortar, whether mixed with lime or cement. The many impurities to be found in sand must act injuriously and tend to detract from the strength of the mortar. The best way to avoid this is to wash the sand, but the expense attached to this process prevents its general adoption. But I have used a "Medway" sand, and one from the neighbourhood of Hatfield, good in quality, being both sharp and clean. Where a mortar-mill is used the "clinkers" from a dust-destroyer mixed in reasonable quantities with sand and lime or cement make a good mortar. But it is always an important point to see that a proper proportion of lime or cement is used, which is not always done.

Bricks.—The question of the qualities of bricks is such a large one that I shall only be able to speak of a few kinds. The numerous kinds of bricks that are now in the market show that greater attention is being paid to their production, chiefly in facing bricks (external). They may be divided into two classes, viz., the "sand" brick and the "pressed" brick. The different processes of manufacture of the two bricks being so different, the sand brick being moulded, whilst the materials are of a dough-like consistency, and the other being "pressed," while the ingredients are nearly dry, must tend to make the pressed brick squarer and more regular in shape and size. But a brick, like terra-cotta, must be well burnt to be durable, and in burning it loses in shapeliness what it gains in durability. But the question will arise in my remarks on the samples of bricks which have been kindly supplied by a well-known firm. I shall use the name by which the brick is technically known.

[The reader of the paper then referred to and commented upon various specimens of bricks in ordinary use which were exhibited, and distinguished by lettering. In regard to *Malms* he remarked that they had gone out of use very much as facing bricks in consequence of the competition of cheaper external facers. The small holes which appeared on them when rubbed were caused by the method of burning, and he thought some means might be devised to avoid this. *Shippers*, next alluded to, were described as similar to *Malms* but harder burnt; they were used as the facing to the London Board Schools, and were the most durable for that purpose in the market. *Stocks* were included in the same class. These three bricks he considered unequalled for durability and cohesion; he had experienced the greater labour in cutting through walls built with them, as compared with pressed or wire-cut bricks. The *Red Sand Brick* (D) had the advantage of retaining its warmth of colour and even improving with age; many were apparently soft, but they hardened with age. *Red Pressed Brick* (E) had an advantage in uniformity of size, but in exposed situations he had seen the surface peel off and expose the rough interior. Comparing D and E the makers of the latter had recognised the demand for a brick regular in size and with a clean sharp arris, while little effort had been made to improve the D type. The latter, however, had the advantage in colour.

The wire-cut brick (F), though used, for cheapness, for internal facing, was inferior to the common Stock. The principal point in favour of the Fletton brick (G) was its squareness and that it could be delivered in London cheaper than a Stock brick in many cases. *Glazed bricks* (H) included many inferior kinds with which it was impossible to do good work, and to make a satisfactory job with even the best quality it was necessary that those laid on each course should be gauged before being laid, or joints of uneven thicknesses would result. *Salt glazed bricks* (I) made serviceable work for dados, &c. Their faults were variation of tint and many small blisters on the surface. A second specimen (J) was exhibited. It was possible to obtain them with these faults reduced to a minimum, but care should be taken that the external and internal facing-bricks were the same thickness.]

Methods of Bedding Bricks.—I think it is essential (except during the winter months) that bricks should be well wetted before being laid. This is all the more necessary where cement-mortar is used. The only possible way to secure strong work is to "grout" each course of brickwork, and this is where the advantage of "washed" or well-screened sharp sand is seen, as it will more readily fill the open joints of the brickwork. The plastering of mortar on the top of each course will not do. But the fact that wet bricks make bricklayers' fingers sore may have

something to do with the neglect of wetting bricks. In work that is to be pointed after the building is erected, the joints should be raked out half an inch deep, and well brushed off with a hard broom to clear away all loose mortar, and the pointing should be well pressed or "ironed" in the joints.

In glazed or enamelled work it may be often noticed that after a time the "glaze" flakes off, and the defective part appears black. This is very often due to using chipped or defective bricks, but it is also due sometimes to another cause—viz., the mode of bedding them.

The bricks having two deep "frogs," and generally being laid in a close joint, care is not always taken that sufficient mortar is spread to ensure the frogs of the brick being solidly filled so that when the weight comes on the wall the pressure is largely on the outer edge of the brick and causes the "glaze" to fly. One way to obviate this is to fill the "frogs" before laying the bricks. Another way is to "joggle" either the end or side of the brick before bedding and fill or "grout" them up with liquid mortar.

One more point, and I shall have finished. The conditions of present-day building often compel builders and others to carry on their work in sections. Very often walls are built avoided I think the connexion or making good to such toothing should be done with cement. Of course there are many other points that I have not touched for want of time.

The President having invited discussion, Mr. Seth Smith, in proposing a vote of thanks to Mr. Toomey, said those present had listened to a paper that was eminently practical. The subject was one upon which they all doubtless felt they knew something, but at the same time it was one with reference to which they could always learn a great deal more—a remark which perhaps applied to almost every department of their experience. He was sure they all learned much more than they could teach the bricklayers very often when they visited work that was proceeding, and found how many practical points, such as those that had been explained by Mr. Toomey, required attention—not only little practical points, but also points of principle, especially the last one, as to the toothing. He had often noticed how extremely weak toothing work was unless it was built up in cement, and it was an excellent suggestion that they should adopt a blocking system instead of the individual courses, where they were obliged to use toothing.

Mr. Francis Hooper seconded the motion. His opinion was that in many cases the workmen with whom architects had to deal were practical men, and where they met with scamped work it was not always the wish of the men that there was that character about the work; there were often other agencies, quite apart from the incompetence of workmen, which were responsible for the scamping that was done. Mr. Toomey had dealt with some very practical points, and if these were taken to heart some benefit was sure to accrue. His remarks as to bonding two different kinds of bricks in a wall were extremely interesting. He (the speaker) had a particular association with brickwork at the present moment, for he was acting on one of the Committees of the Institute, and that day he had been to the West India Docks to witness the experiments being carried out there in the testing of brickwork. Feeling that there was still an opening for experimental research as to the relation between the brick and its use in a wall, the Institute had had a series of piers built, and tests were now being brought to bear on piers that had been erected some four months. A remark had been made by a very competent contractor that it was futile or unreasonable to use a pier at such an early stage; but, as a matter of fact, brickwork was tested at a very early stage of its existence, although it might not at once have to bear the full strain to which it would ultimately be subjected. It was very interesting to know the strength of a pier in its early days, and in order to extend the experiment other piers built at the same time were to remain for another eight months, when they would be able to ascertain what was the increased strength after a further interval for the purpose of setting. By carrying out these experiments, the Institute would be rendering very great service, not only to the profession, but also to the community. He considered the relations between the architect and the operatives on a building should be of the most cordial kind.

Mr. F. T. W. Goldsmith wished Mr. Toomey

to tell the meeting exactly how to carry out the ordinary specification for laying bricks in a 9-in. wall. His attention had been called to the point by an eminent and much-respected member of the profession, and he had since asked a number of bricklayers, some of whom had said one thing and some another. If the bricklayer had to mortar every side of his brick except one, how was he going to put the bricks into his 9-in. wall? Nine men out of ten had told him they could not do it. There would be no adhesive material whatever between the vertical joint of the brick, if what Mr. Toomey advocated was carried out, for that gentleman insisted upon $1\frac{1}{2}$ in. of mortar being raked out. In that case the only thing to hold the wall together would be the mortar that pointed it. Mr. Goldsmith further said he was gratified to see an operative amongst them, and trusted Mr. Toomey's would be the first of many such papers that might be read before the Association.

Mr. B. F. Fletcher remarked that Mr. Toomey had made mention of wetting bricks in the summer, but surely it was just as necessary to wet them in winter, though not perhaps to the same extent. Regarding a mortar-mill, he wished to ask the reader of the paper whether he had any ideas as to the relative strength of mill-made mortar and ordinary sand (hand-made) mortar. Bricklayers always thought the former was very much the stronger; and further, if they used mill mortar they could use up broken bricks. He believed Byzantine brickwork was almost entirely made with broken bricks. As to the thickness of the joint in Roman work, as well as in Tudor work in England, they seldom saw less than half-an-inch of mortar. He was at Compton Wynates in the past summer, and noticed there was no Tudor work there which had less mortar than half-an-inch. Architects often specified that no four courses should rise more than 1 ft.; but why should they not rise even 1 ft. 3 in.? If the mortar was good, why should they not have plenty of it? The limit stipulated by architects was painfully apparent at Compton Wynates, because in the Queen Anne brickwork they saw such thin mortar joints that the effect could not be compared to that of the work of the Tudor period. As to toothing, engineers did not believe in it at all, as it was bound to result in cracks and broken bricks.

Mr. F. Walker congratulated Mr. Toomey on the practical paper he had read. With respect to the question of washing sand, that was all very well if they could afford to pay the expense; building, like everything else, depended upon the price being paid for it. His experience was that they could get plenty of sand without washing that would serve their purpose. He was now using some unwashed sand—certainly it was Thames sand—which was thoroughly sharp and angular. In that case washing would be altogether superfluous. In his opinion, it was immaterial where they got their sand from provided it had the requisites to make good mortar. The mortar-mill had its advantages and its disadvantages. An advantage was that the ingredients got fairly well incorporated. A great disadvantage was that unless a careful man superintended the grinding, the mortar would be ground to such an extent that there would be no grit left in it, and that when it dried it would become mere dust. It was often specified that no more mortar should be made than could be used on the same day, but they were told that the Romans and other ancient builders, slaked their lime a long way ahead of its being required for use. His own experience was that the older their mortar was—provided it was not allowed to get thoroughly dry—and the more often it was tempered and re-tempered, the more tenacious and workable it became. He noticed that the samples of brick exhibited were all from one maker; he, however, would like to have seen samples from other manufacturers. With regard to sand faced and pressed bricks, his opinion was that unless they were thoroughly good they were not worth using. The peeling of the face of pressed bricks was due, he thought, to the use, for the purpose of oiling the moulds used in the pressing, of machine-oil, which deteriorated the face of the brick to some extent. He did not care for malms for exterior work, because of their absorbent nature; unless they obtained very hard malms they could not generally be used for front and best work, for they not only absorbed moisture, but also held soot particles, &c. Shippers were undoubtedly the best bricks that could be used in London, not only for their hardness, but because of their having a variety of colour, which was more pleasant than the dead, even, yellow tone which

they saw in a maimed front. Mr. Toomey had said that the red in red pressed bricks was a somewhat questionable quality, as it indicated that the brick had not been thoroughly burned. His (the speaker's) own experience, however, was that the darker the colour the more durable was the red brick, and that the colour was a good criterion to go by. If they secured weight, density, and darkness of colour they might rest assured they had a thorough good brick. He agreed with Mr. Toomey that Leicester produced very good bricks, but it was a generally-accepted opinion that the whole of the coal measures yielded good ones. Everybody had doubtless noticed that red sand faced bricks improved with age, especially the Fareham bricks; not only in colour, but also in their weathering properties. Wire-cuts had, no doubt, the advantage of rough sides, thus giving a stronger adhesion for mortar, but in other respects he did not care about them. Nor was he favourable to Flatton bricks; no doubt, they were very much cheaper than stocks, but for exterior work they had very poor weathering properties. With regard to glazed bricks, these could not be made into good solid work unless they had a fair joint, and another unfavourable point about them was their susceptibility to craze, which looked like pencil marking. He would point out that a salt glazed brick was not dipped; the glazing was done in a kiln by means of a salt vapour, and the bar which would be seen running across some of the faces was caused by the bricks being placed too close together in the kiln, in which case the vapour was not able to reach the whole of the face properly. With respect to the unequal thicknesses of joints, this could not happen in gauged work. If they wanted to obviate the possibility of shrinkage or anything else that was likely to lead to fractures or cracks, they should gauge their mortar with Portland cement for interior work. The speaker next opined that it was dangerous to wet bricks in winter, though they wanted it in the summer, to effect a proper adhesion, which might otherwise be prevented by dust. In America, during severe frosts, they had large fires, surrounded with bricks, and they used not bricks and hot mortar. That was a bad way of building, but they were surrounded by circumstances to which they were bound to conform. He agreed with Mr. Toomey that if pointing were done, the point should be well raked out. If they insisted on that, they would soon do away with pointing, because the raking out would cost as much as the pointing. He was unfavourable to pointing, which he contended was productive of a bad, shoddy class of men. Let architects get back to the old style of striking the work as the brick-laying went along, and then they would obtain good work and good workmen. Everybody admitted the evil of toothing, which could not be compensated for, whatever they might do. On the question of mortar, bricklayers liked that which was mill-made, it being more plastic and pliable to their trowels, but he personally preferred the old hand-made mortar, in which they obtained the pure ingredients.

Mr. Owen Fleming considered the Association was much benefited by one of the great organizations of workmen sending a representative to discuss with the architects one of the crafts with which they had to deal. They had expected three crafts to be represented, but their regret at two of those not being represented, was tempered by the satisfaction they felt in being able more thoroughly to thresh out the subject of brickwork. He hoped that, at some future time, papers on lead-work and wood-work would be read at their meetings. It might also be well for the Association to send a representative to gatherings of the workmen, so as to lay before them the views of the architects. As to the manufacture of mortar, the economic conditions of London work compelled the use of the mill. They often built upon the site of an old building, where there were excellent old bricks for making mortar, provided they used also a certain proportion of sand. Such mortar, however, was not of the colour that an ordinary architect liked for the joints, and therefore he thought that when he came to have the work done the London architect would probably let his theory go, and have his job pointed down afterwards. He wished to ask Mr. Toomey whether there was any combination of sand and cement that would withstand the frost and give that pleasant creamy-white appearance that was so admired by architects, in combination with red brick. As to bricks generally, Flettons had their use, but were not good for outside work, as in this case their skin was likely to

come off. There were many places inside buildings where Flettons could well be used, and they were of course cheaper than stocks. As to external work, doubtless members of the Association had noticed that in the market lately stock facing and red facing had come very close, and red facing of a really decent kind had even been obtainable cheaper than stock facing. This was not so much because of the initial cost of the brick, although that had a good deal to do with it, but because it was very difficult to do a good stock-faced job without spending a very large amount of time and labour. Stock bricks were so knocked about that when they came to be used it was difficult to find a single face without the arris being chipped. He thought London contractors preferred to do a good red sand-faced front than a stock-faced front. Of red bricks, the sand-faced was the best for London; it was cheap, it looked well, and it generally kept its colour, but sometimes these bricks had the curious habit of getting green. With reference to the mortar question, he had specified that the joints should be well flushed up, and finding this had been done he had complained, to be then told that he should have said at first that he wanted a "buttered" joint. He wished to know whether an architect, if he wanted the bricks covered with mortar, must specify "buttered" joints.

Mr. H. H. Statham said that in the days when he was a pupil a flushed-up joint meant that the brick should be entirely surrounded with mortar, and he thought "buttered joints" was a corruption of the bricklayer, perhaps of the contractor. Mr. Fletcher had referred to thick mortar joints. That was an aesthetic question partly. There were some people who said, "The less you see of the joints, the better"—that was to say, a brick wall was to be one expanse of smooth brickwork. That was what might be called a neat taste. Others wished to see as broad a mortar joint as they could practically have, and that was what he called an architectural taste. There was a grand nervous look in a wall with broad joints, which they could never get by smoothing down and making it as thin a joint as possible, and that was the way the greatest ancient architectural works in brickwork had been carried out. The reluctance of many modern architects to have thick mortar joints might be explained by the fact that, whereas they could see before them the bricks that were to be used in a building, they did not know what the mortar would be like, and they were naturally nervous in trusting to a considerable thickness of mortar, which might result in a settlement. To his mind a thick joint had the finer appearance in every way.

Alderman Taylor said the representatives of the workmen present were very pleased to be able to come into contact with the architects, and his opinion was that a great deal of good would come of such meetings, provided they each understood what the other required, which was the end at which they should aim. In setting out the front of a building he thought architects made a mistake in giving, as they nearly always did, the size of the openings instead of the size of the piers. If they were to give the size of the piers, and let the openings work out at whatever size they might, they would get a proper bond in all their piers. When the openings were set out they got a broken bond in every pier in the building. When he commenced work about a quarter of a century ago, his father, whom he then assisted, never did any painting, and the face of the work they did then was now as good as ever, scarcely a joint having gone anywhere. If it were possible to carry out work on that principle twenty-five years ago it was possible at the present time. If anything had tended to demoralise the trade of the bricklayer it was the introduction of pointing and the so-called specialists. If the workman who laid the brick had to give them the finished article in the first instance he would naturally take more care over his work than if he knew somebody else was to finish it for him, who would in all probability spoil it in the finishing. He had seen many jobs that looked better when they were pointed. He hoped the work would be reintroduced. Let them once have a demand for the workmen, and they would get them, and the work would be done to their satisfaction.

A Member inquired whether any of the buildings referred to by Alderman Taylor were erected in the winter.

Alderman Taylor replied that they were. As to g-in. walls, and properly filling up the joints, he knew that some architects specified that cross-joints should be put up the whole length of the brick. He could only say it was practically

impossible to get good work by doing so because of the great difficulty experienced in obtaining bricks which were perfectly square. With regard to milled mortar, he was once engaged on a job where such mortar was used, and he said to his mates, "Why, you could grow potatoes in this stuff. I've never used anything like it before." About twelve months after he was engaged on an adjoining building, and had to cut out some of the old work, and it was not until then he realised what excellent mortar it had been; he had imagined it to be the rottenest stuff possible, but was mistaken. This led him to the conclusion that they might get some very good mortar from the mill, provided no dirt or mould was allowed to find its way into it. The speaker urged that if architects would draw up practical specifications and insist on having them carried out they would revolutionise the building trade. He was sure that, whilst the architect was anxious to make a drawing look pretty on paper, the workman was just as anxious to make the building itself worthy of admiration.

Mr. Woodthorpe, referring to the question of bricks that would keep out the weather, said his own experience was that bricks made in sandy districts could not be used for hollow walls.

A Member said that some years ago there was a good deal of talk about mixing sugar and treacle with mortar, but he had heard nothing of the matter since. Had Mr. Toomey ever heard of such ingredients being used?

The President remarked that the innovation of which he spoke in anticipation at the previous meeting had proved a very great success, although at one time he feared it would end disastrously. It had been intended to have three papers, but the gentleman who was to have addressed them on "Lead Work," had a difference with the committee and his union and was unable to do so, while Mr. Rust was prevented by family bereavement from reading a paper on "Woodwork." Still the meeting had been a success, thanks to Mr. Toomey, Mr. Walker (whose manual on "Brickwork" was well known), and others.

Proceeding to make a few observations on the subject of the evening, the President advised the younger members of the Association to avoid the mortar-mill. On the whole, its evils outweighed its advantages, for he had known cases where the mortar had been ground to such an extent that there was no goodness left in it, and it was exceedingly difficult for the architect and for the clerk of the works to discover when that was the case. The question of pointing was exceedingly important, and he was in favour of striking the work during its progress. One of the greatest evils that had arisen from the necessity of doing rapid work was this pointing, which was hardly ever properly done, the result being that buildings had to be repointed year after year. If the building had to be finished in the winter or early spring, however, it seemed almost a necessity to do the pointing after the completion of the work.

Speaking of frost reminded him that in the northern countries of Scandinavia they used, in the winter, mortar partially mixed with un-slaked lime, and the process of slaking set up heat and prevented the mortar from freezing. That seemed very simple, and he had tried it in England, but had signally failed. It was certainly in that direction that they should advance, if they advanced at all, rather than in the direction alluded to as to what was done in America. He had always preferred wide joints for both brickwork and stonework, and was glad to hear Mr. Toomey's practical observations on the subject, as well as to hear Mr. Statham uphold wide joints from the aesthetic point of view. They would never do wrong in building if they had wide joints, provided always that the work was not required to be done too rapidly. Obviously the wider the joint the more tendency the masonry there were of a settlement taking place, especially if the work did not go up regularly, and thus put a limit on the joint referred to by Mr. Fletcher. Connected to the question of wide joints there was another aesthetic question. He had over and over again been asked why he preferred very small bricks to those of ordinary size. His answer was because of the difference of effect in the building. Pugin, in his "Contrasts" gave a building drawn in one case with large stones of equal dimensions, and then the same building drawn with small stones irregularly bonded, and the difference in scale which appeared in exactly the same building with the same outline and detail, was remarkable. The same thing applied to bricks. In the north

it was a frequent and abominable custom to erect three courses in 10½ ins., the bricks being 3½ ins. instead of 2½ ins., and the building consequently looked much coarser and harder than where smaller bricks were used. The reason was that the brick itself was sufficiently large for them to see the regular pattern and joint of the brickwork. As they reduced the size and increased the mortar there was a greater need of dividing lines, which confused the eye, and therefore the actual pattern of the laying of the bricks, which of course were laid symmetrically, was lost. The result was the same as in Pugin's building, namely that the building looked much larger and broader with the small brick and wide joint than with the large brick and narrow joint. Those present would have noticed how extraordinarily buildings in Italy were affected by earthquakes. He was sure that many of the earthquakes which had taken place there and destroyed many buildings, would have had little effect in any country where decent buildings were erected. The reason was that in Italy they nearly always had fine weather, and the mortar and stones or bricks used for building purposes were almost dry, so that if they cut into an old building in Italy they found no adhesion whatever. They used excellent materials, and yet had that wretched result. He remembered a law case between an employer and a contractor who refused to wet the bricks he used, because that was not provided in the specification, and this pointed to the fact that it was wise to mention the matter in a specification. As to the absorbent character of bricks, he had known hand-pressed bricks carry water through to the inner side to a much greater extent than sandy and apparently very porous bricks. It was really very difficult to decide which class of brick carried the water through most. He regretted the influx of Leicester bricks into London, for there was nothing more commonplace or miserable than the colour of Leicester bricks, which were hard and unsympathetic to a degree. If they could feel certain that their excellent sand bricks would keep out the water they would do much better to stick to them. Peterborough or Fletton bricks were exceedingly difficult to plaster upon, owing to their affording no key when the joint was flushed up straight. If they used Fletton bricks in the interior they should be careful to specify, if they were going to do plastering, that the joints were kept well back.

The vote of thanks was carried unanimously.

Mr. Toomey, having acknowledged the compliment, proceeded to reply to several of the questions raised. With reference to a 9-in. wall and cross-joints, if the architect specified joints to be put right through, that was the only solution of the question. At any rate, if they laid a heading course, whether specified or not, cross-joints should be put at least 4½ in. on the face. As to wetting bricks, he was well aware that in winter there was an objection to pursuing this course on account of frost. He agreed that it was possible to grind mill-mortar too much, but his experience was that this was not done, and that the usual complaint was that the mortar was too rough. He had never known an instance where the stuff was ground too much in the mill. In most cases the mortar was mixed down in the basement in the dark, and not one clerk of the works in one hundred went down there. The consequence was that the proportion of sand to cement varied between 2 to 1 and 20 to 1, the matter being left to the sweet discretion of the man who did the mixing. There were objections to both kinds of mortar, but if the ingredients were all right they would get a better mortar—more regularly incorporated—from the mill than from hand-mixing. His opinion of the Fareham brick was that no better was made. It was far better than the Lawrence brick, though the latter was preferred by many because of the question of price, and also because the cutting of the Fareham brick involved 25 per cent. more labour. It had been asked whether mortar would stand frost; the only time it would stand frost was when it was freezing very hard. For hollow walls they must have a brick like a shipper, and space should be provided at the bottom for clearing out the mortar that fell down between the walls. He had heard of the use of treacle and sugar in mortar, but had never known these ingredients to be tried practically; they had certainly never been in common use in this country. As to the use of Fletton bricks for plastering or internal facings, they would not take the plastering as well as stocks unless the joints were well raked out. Others besides Flettons required this to be done to the

extent of at least ½ in. before the plastering was proceeded with. The speaker deprecated the sub-division of labour to which subsequent pointing led, remarking that if they so cut up the trade the really practical men would become extinct, just as the cabinetmakers of the old time had. The pointing of the Great Northern Hotel was done as the work proceeded, and the work remained. The bricks used were malms. On the question of pointing there was one objection—namely, that sometimes men would take three courses, and then point them; but if that were done they would not find they had the durability which was secured if the pointing was done as the men went along.

The President announced that the next meeting would be held on January 10, when Mr. H. T. Hare would read a paper on "Municipal Building." The meeting then terminated.

NOTES FROM THE STRAITS SETTLEMENTS.

ON the night of September 30 last, Singapore was the scene of a disastrous building calamity—the sudden collapse of a large building in course of construction in the centre of the business quarter of the town, resulting in the entombment of fourteen Chinese workmen, twelve of whom were taken out of the debris dead, and the other two were rescued alive, but one died next day, making the total number of deaths thirteen. Besides this, two Europeans who were passing at the time were injured but not seriously.

Fortunately the disaster occurred about nine o'clock at night, when the business part of the town is almost deserted. Had it occurred during the day a very large number of people must have perished, as the spot is a very busy one.

The building which collapsed was one end of a large block of business premises, part of which has been finished and occupied for some months. The place was intended as a large retail store and wholesale warehouse, except two small portions at the ends, which were to be let separately as "shop houses." It was through making up one of these shop-houses quickly and in advance of the other work that the accident occurred—or so it is supposed.

The building is a lofty one of three stories, with turret and heavy brick dormers above. When the collapse took place the main walls were up about 40 ft., except in one place, where they were up the full height—that is, fully 20 ft. or 30 ft. above the rest of the work. Piers of brickwork 10 ft. or 12 ft. high had also been built above the general level. In the afternoon of the day the place fell there was an exceptionally heavy storm of wind and rain, and no doubt this had a bad effect on the rapidly and badly-built brickwork, which was standing so much above the general level.

The work was disgraceful, especially the brickwork, and when one examines the remains one can see how difficult it would be for such a building to withstand a storm.

The place was being built by its owner, a Chinaman named Tan Jik Kim, who engaged an architect to prepare plans and superintend the foundations, but would not pay for the superintendence of the rest of the work.

At the inquest on the bodies the coroner's verdict was "that the contractor was guilty of a rash act not amounting to homicide." He has to appear at the sessions on the 18th inst.

Some time ago the Chinese Protectorate Offices, which were erected by the P.W.D. some few years ago, suddenly sunk on one side, the front side, so much so that the walls were nearly a foot out of plumb. To remedy this defect the Government are adding on new rooms in front and generally repairing and enlarging the place.

Large blocks of barracks are being built on the islands of Pulau Brani and Bidadari, which are to be occupied, I believe, by the Royal Engineers and Royal Artillery.

In Singapore no very important buildings are going on at present, but there is a great demand for moderately large houses, for which very high rents can be obtained. Many new houses are being put up, but still the demand exceeds the supply, and judging by the rents so easily got, the owners of house-property must be having a good time.

The Government Offices at Selangor, which we described a year ago when the foundation-stone was laid, are going on rapidly, and already the roof is being put on; this is very much sooner than was expected. The work has been entirely done departmentally, under the direction of the State Engineer.

The waterworks which will supply Kuala

Lumpur, the capital of Selangor, and which have been in course of construction during the last five years, are now nearing completion, and will be opened by the Governor of the Straits Settlements in December. Already part of the place is being supplied from the auxiliary reservoir. The water is brought from Ampang, a distance of about six miles from the town. There are two impounding reservoirs (one is a very small one, to be used as an auxiliary), and the water gravitates through pipes to the service reservoir near the town, on a hill about 230 ft. above the plain. From this the town is supplied—the native quarter with street stand-pipes, and in the European quarter it is laid on to the bungalows.

Two miles from Kuala Lumpur a new gaol is being completed. It is designed to accommodate 504 prisoners, who will be most comfortably housed—far more comfortably and cleaner than most of them would be in their own huts.

Next year very little is to be spent on buildings, and all the available revenue will be spent on new roads.

Now that the Federation of the Native Malay States is sanctioned, Kuala Lumpur must go ahead even more rapidly than it has hitherto done, as it is to be the seat of the Federal Government.

In the Native State of Perak not much building is going on. They are building new Government Offices, and are spending only half as much on them as their neighbours in Selangor.

A very important piece of road known as the Slim road is under construction, and when this is completed there will be a cart-road from Malacca in the south to Province Wellesley, opposite Penang, in the north.

Not long since an istana, or palace, was built for H.H. the Sultan of Perak. On plan it is a large parallelogram, and the style of work is Renaissance. X.

ELECTRIC TRAMWAY IN ROME.

THE new electric tramway which connects the main railway-station of Rome with the centre of the city is proving a great success as a means of rapid communication between the high and the low parts of the city, although it has had many difficulties to contend with. The Local Authorities wisely refused to allow their principal streets to be desecrated by the poles and wires of an overhead system of traction, so the route chosen was very difficult on account of the steep gradients encountered in several places, as well as some very sharp corners. It starts from the Piazza S. Silvestro and goes up the Via di Capo le Case, and then through the Ludovician Quarter to the Piazza di Termini. It consists of a double track nearly two miles long, and the general arrangements are the same as on the Havre tramways. Where telegraph and telephone wires cross the tramway, guard-wires of steel are suspended to stop their fall and prevent them touching the trolley-wire, if by any chance they broke. They are certainly not beautiful, but they are essential to the public safety. The trolley-wire is supported by double-bracket standards; where the track makes sharp bends cables attached to the walls are necessary to pull it out into the required curve, the wire coinciding really with the sides of the inscribed polygon. In some places the incline is over 8 per cent., so special brakes are necessary. Both hand and feet brakes are used, one acting on the wheels directly and the other on the rails.

In addition, there is an electric emergency-brake, which will stop the car in a few yards, even when going quickly down hill. The principle of it consists in short-circuiting the motors, which are then driven as dynamos by the momentum of the car, which is thus rapidly stopped. The cars weigh seven tons when empty, and when loaded their carrying capacity is stated as forty; but there are often more than fifty passengers on them; their weight is about ten tons. They start every five minutes, and take thirteen or fourteen minutes to perform the whole journey, the maximum speed allowed being nine miles an hour. The cars are well lit, and an elaborate system of electric-bells enables each passenger from his seat to communicate with the motor man.

The motors are worked by current bought from the Electric Lighting Company, who possess the famous Tivoli-Rome transmission plant. At Tivoli, on the slope of the Sabine Hills, the power developed in large turbines is converted into electric energy by alternators, and is conveyed at high-pressure by four cables across the Campagna, a distance of eighteen miles, to a transformer-house just outside the Porta Pia, where the pressure is reduced before

it is distributed to various sub-centres in the city. As the current is alternating, it is transformed into continuous by means of high-speed dynamo motors; it is then used to charge accumulators, and give a constant 550-volt supply to the trolley-wire.

The General Electric Company of America did the overhead work and the equipment of the cars.

ALMANACS AND DIARIES FOR 1896.

We have received from Messrs. Hudson & Kearns, of 83, Southwark-street, S.E., a parcel of their diaries and blotting-pads for 1896, the merits of which we have referred to in previous years. "The Architect's Diary," issued in two sizes, Nos. 12 and 13 (one and two pages to a day respectively), has been made more useful to architects by the inclusion, in response to our criticism of last year, of more information respecting provincial architectural societies, though even now the information is not complete, and what is given might be better arranged. All architects who use these diaries may be expected to refer to them for the names of Presidents and officers of provincial and other architectural societies, and the more complete this information is, the more satisfaction will the works give. For the rest, we have nothing but praise for the diaries. They are well-arranged, and contain, in addition to the usual information, the names and addresses of District Surveyors, cases of interest to the profession decided in the Superior Courts during the legal year, from November, 1894, to August, 1895, the professional practice and charges of architects, revised regulations under the 1894 Building Act, the Metropolitan Management and Building Acts Amendment Act, 1878, some of the architectural, surveying, and engineering institutions, with the names of their Presidents, &c. "The Builder's Diary" No. 11, and "Diary and Note-book" No. 9, contain much of the information to be found in the Architects' Diaries, but they have been arranged more for the use of builders and contractors. The same firm also send us some date-indicating blotting-pads in various styles and sizes. Nos. 8, 8A, and the "Banker's Pad" are especially good pads.

"Sprague's Pocket Diary and Architects' and Surveyors' Memorandum Book, for 1896," revised edition, is a useful little memorandum book, containing a number of tables of statistics and data as to materials used in building, &c. It is issued, as before, in two forms of cover; one as a memorandum book closed by a band, the other as a flat folding case for carrying letters or memoranda, with the diary in one of the pockets.

"The British Almanac and Companion" for 1896 (London: The Stationers' Co.) contains, in addition to the usual information relating to public offices and departments, and Acts of Parliament passed in the last Session (with abstracts of the more important ones), Mr. R. Langton Cole's usual review of architecture in the past year. The article, which is accompanied by an illustration of Messrs. Aston Webb and Ingress Bell's addition to the old Chapel Royal in Whitehall, and which briefly describes most of the more important buildings erected or being erected in London and the provinces during the year, in referring to the decorations at St. Paul's, proceeds as follows:—"The gilding, however, to an architect's eye, seems to largely destroy the design of the building, and to leave no merit to honest stone over its counterfeit in plaster. The gold on the cornice may be needed, to avoid too sharp a break between the ceiling and the walls, but the gilding of the capitals does not seem so necessary. As a whole, however, the decorations will give the Cathedral the warmth and colour which Wren meant it to have, and that in a form worthy of the building and its great designer."

The same work also contains the following articles:—"The Art of the Year," by Mr. Charles Kains-Jackson; "Drama," by Mr. Joseph Knight; "Engineering in 1894-95," by Mr. Langton Cole; and "Science," by Mr. E. W. Maund.

From Messrs. W. H. & L. Collingridge (City Press office, Aldersgate-street, E.C.) we have received the "City Diary and Almanac for 1896." This well-arranged and handy little annual contains a large amount of information in regard to City and City affairs, and the fact that this is the thirty-third issue speaks well for the work.

"The Railway Diary and Officials' Directory for 1896" (London: McCorquodale & Co., Ltd.) has been sent us. The diary contains a great deal of information as to traffic returns, accounts, dividends, list of officials, &c., which will prove interesting to some of our readers.

The same publishers issue a "Railway Almanac," which is a useful sheet.

"The Indian and Eastern Engineers' " Diary for 1896 (Calcutta) and London, 1 & 2, Victoria Mansions, S.W.), which is presented to yearly subscribers of that journal, contains, as a new feature, a railway directory, which embraces the whole of Asia, except Turkey and Russia. The tables and formulae have been retained this year, and some additions have been made to them. The publishers draw special attention to the table of conversion of English and metric weights and measures. The work also contains a directory of British merchants and manufacturers, besides other useful information. As we have stated on previous occasions, the diary is very well got up, and no doubt it is much valued by those for whose use it is specially intended.

Another useful and well-arranged diary is that published by Messrs. Hazell, Watson, and Viney, Limited, of Long Acre, W.C., and which is called "the District and Parish Councillors' Diary and Guardians' Manual for 1896." The diary consists of two days to a page, and contains a full text of the Local Government Act, 1894, a digest of its provisions and most of the enactments incorporated with, or referred to in, the Local Government Act, the circulars of the Local Government Board, and a mass of general and useful information. The work also includes the more important circulars and memoranda issued by the Local Government Board and other Government departments.

THE POST-OFFICE LONDON DIRECTORY.

"THE Post-office London Directory for 1896" (London: Kelly & Co., Limited), is the ninety-seventh issue of a work which becomes larger and more indispensable each year. Though the Directory has increased by no more than twenty-nine pages (3,002 pages against 2,973), still the prospect of a bulkier work each year has suggested the need of separate sectional directories, which, we believe, will become a necessity of the future. The size of the work, however, in no way detracts from its value, and evidence of the care with which it has been edited is found in every section. The Directory is, as usual, corrected close up to date, and though no new feature has been introduced in the present edition, a considerable addition to the number of registered telegraphic addresses and telephone numbers has been made in the Commercial division. The map is again strengthened by being mounted on linen.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.
—A meeting of the Edinburgh Architectural Association was held on the 18th inst., Dr. Rowand Anderson in the chair. Mr. G. S. Aitken read a paper by Mr. Thomas Arnold, who was unavoidably absent, on the Mausoleum of Halicarnassus—the tomb erected by Queen Artemisia in honour of Mausolus. Mr. Arnold, in the course of his paper, explained that he had observed in Sir Charles Newton's plans three piers adjoining the excavation foundation, and that on examining these he had found a relation between them and the intercolumniation. From this he had started to restore the whole building. Pliny's dimensions he had taken as the basis of the restoration, but the height which Pliny gave was generally given as a hundred and forty feet. Mr. Arnold's contention was that not more than a hundred feet ought to be allowed. In this way the podium or base was contracted to 25 ft. in height instead of 65 ft., which was the dimension in the former restoration. This difference of dimension constituted the principal feature in the restoration of Mr. Arnold, who, by a number of diagrams, showed how the dimensions which he had arrived at could be included within several geometrical figures. Some remarks were made on the subject of the paper by Mr. D. W. Vallance, Assistant Curator of the Museum of Science and Art, who said that there was almost a coincidence in the subject coming before the Association at the present time, as Sir R. Murdoch Smith had secured for the Museum a complete cast of the order of the mausoleum, which would be placed there in a few months. From its height of nearly 40 ft. it was impossible to set up the entire original in the British Museum, where it stood in two parts, and the cast in the Edinburgh Museum would show the order for the first time as it appeared on the original monument at Halicarnassus. Continuing, Mr. Vallance said he thought it unfortunate that Mr. Arnold had not strengthened his case by

showing how exactly his restoration of the mausoleum agreed with that worked out by Sir R. Murdoch Smith in 1858, while he was engaged with Sir Charles Newton in the excavations at Halicarnassus. Referring to Sir R. Murdoch Smith's official report to Parliament in the Blue Book for 1858, Mr. Vallance showed how closely both the description and drawings there given agreed with Mr. Arnold's restoration. The only real point of difference between Mr. Arnold and Sir R. Murdoch Smith lay in the reading of one of Pliny's dimensions, and this difference of opinion affected only a part of the building of which really nothing was known. In all essential points the present restoration was based, Mr. Vallance said, on that made by Sir Murdoch Smith, and entirely confirmed it. On the motion of the Chairman, a vote of thanks was given to Mr. Arnold for his paper.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution on the 17th inst., Sir Benjamin Baker, K.C.M.G., the President, in the chair, the paper read was on "The Design and Testing of Centrifugal Fans," by Mr. H. Heenan, M.Inst.C.E., and Mr. W. Gilbert, Wh.Sc., Assoc.M.Inst.C.E. The object of the experiments recorded in this paper was to determine the best form of fan-blade and fan-case, and the most economical diameter and speed of a fan, to produce any required volume of air at a given pressure. After referring to some of the practical difficulties involved, an outline was given of the manner in which the performance of a fan should be tested, a blast-fan, 28 in. in diameter, being selected for illustration. A distinction was made between the velocity- and pressure-gauges for various deliveries, and the method of drawing the characteristic curve was explained. The effect of variation in the shape of the blades was next studied, those chosen having tip-angles of 35 deg., 60 deg., and 90 deg. respectively, the fan-centre being 17 in. in diameter. It was shown that the blade having the radial tip gave the best result. The experimental apparatus used for testing the smaller classes of fans was then described. Each fan delivered air through a circular iron tube into a boiler-flue 2 ft. 6 in. in diameter and 13 ft. long. Circular orifices of various sizes were fitted in the flue to form graduated resistances, and the air-velocity was estimated by an anemometer at the open end of the flue. A transmission dynamometer measured the power absorbed by the fan. It was remarked that considerable differences in the velocity of the air might exist at the same cross-section of the delivery tube of the fan, in proof of which drawings were exhibited of the curves determined by experiment and of those obtained from some of the fans tested. The Heenan mine-ventilating fan, tested at Parkend Collieries, had a fan-centre 7 ft. in diameter and 2 ft. wide. This fan was designed to pass 20,000 cubic ft. of air per minute at 34 in. of water-gauge, and the result was found to agree well with the rules developed by the authors. A variable resistance was provided by closing the mouth of the air-drift to a greater or less extent. The h.p. given to the fan was obtained by indicating the engine. Characteristic curves for tip-speeds of 5,000, 6,000, 8,000, and 9,000 ft. per minute were given. The maximum efficiency was 70.3 per cent. The comparative output of fans of the same type, but differing in size, showed that, if they were run at the same tip-speed and produced the same water-gauge, the air discharge would be proportional to the centre section of the fan, that was, to the diameter multiplied by the width. This being so, if the air discharged from any fan and the corresponding brake horse-power were divided by the area of the centre section, the characteristic curves plotted from these data, with the observed water-gauge, would be the same for all sizes of fans of the same type. It was shown how the dimensions of a fan could be determined from these curves, so that the most economical result might be obtained; and an apparatus was described, by means of which the accuracy of the water-gauge tips, used for the measurement of air pressure and velocity, was tested. To test the facing gauges the following method was adopted:—The tip was moved at a known velocity through air at rest, by causing it to describe a circle of 20 ft. circumference, and provision was made whereby a water-gauge recorded the air-pressure set up. The pressure in feet of air due to a velocity in feet per second, was obtained by dividing the square of that velocity by 64.4; and it was found that a facing-tip, whether conical, parallel, or bell-mouthed, when used in con-

nexion with a water-gauge, would record this amount correctly. Three side-tips, which had been used to determine the compression existing in a stream of air flowing through a pipe, by placing them at right angles to the direction of flow, were next tested. The object was to determine how far these tips were affected by induction. Two of the tips consisted of pieces of pipe, $\frac{1}{8}$ in. bore, and having external diameters of $\frac{1}{8}$ in. and $\frac{3}{8}$ in. respectively. It was found that, owing to induction, the pressure recorded was less than the correct amount by a quantity equal to about 45 per cent. of the gauge-reading, which would represent the velocity of the air-stream in question. The third side-tip had a plate 2 in. in diameter screwed to the end of the pipe, the edges of the plate being bevelled. The readings of this gauge were found to be correct, and it was used in all the experiments recorded in the paper. The tip-speed varied between 60 ft. and 190 ft. per second. A series of tests made to determine the efficiency of an expanding chimney was then recorded. Air was passed from a fan through a delivery tube into an expanding chimney, the sides of which could be set at any desired angle to the centre line of the tube. The efficiency for any angle was obtained by dividing the vacuum observed at the throat of the chimney, by the calculated vacuum due to the reduction of velocity of the air as it passed from the inlet to the outlet of the chimney. The results of the tests showed that the angle on each side might be as much as 15 deg. without loss of efficiency. The air speed recommended at the chimney outlet was 30 ft. per second, and the efficiency with this speed varied between 0.43 for 6 deg. opening and 0.42 for 15 deg. opening on each side.

Illustrations.

WINDOW OF CHAPEL, EMANUEL SCHOOL, WANDSWORTH COMMON.

THE central light of this window was put in to the memory of the Rev. A. Towsey, formerly head master of the school. The two side-lights were filled in commemoration of the tercentenary of the founding of Emanuel Hospital by Lady Dacre—the funds being collected through the energy of the Rev. A. Chilton, the present head master. There is a rose above the centre light, which was filled with glass by a firm, since bankrupt, some years ago. The three angel heads replace some lavatory-glass with "sacred emblems," which the same firm put in three frames intended to act as ventilators, but which failed of their purpose and had to be nailed up.

The canopies are whites on a ruby ground. The Virgin's dress is ruby on yellow in the two side lights, her robe being of two green-blues; in the centre her robe is blue with lining of ruby on yellow, and her dress white and stain. The angel on the left is green and yellow, on the right, white. The Christ is robed in white and stain with ruby girdle. The wise men are grey-green with deep ruby girdle and turban; white and stain with sleeves of ruby on yellow and blue-green robe, moss-green sleeves and grey-green dress with cloak of blackberry jam colour, which colour appears again in the Annunciation angel's wings and the stripes of the curtain on the other side, which are alternately that colour and green. Joseph is a sort of old-gold colour with green girdle and purplish nimbus. The fountain is white. All the rubies are very streaky and varied. It is, however, very little use striving to describe, in few words, the colour of a window; everything depends upon the quality of the glass and the juxtaposition of the various tints.

"PHILIPHAUGH," SELKIRK.

THE extensive additions and alterations that have been in progress at this house during the last three years were completed in August.

Owing to the different levels of the floors, it would be impossible to show correctly the internal arrangements without giving several plans. The principal additions shown in the view given are the east wing and clock-tower, main tower, entrance gable, picture-gallery, and museum.

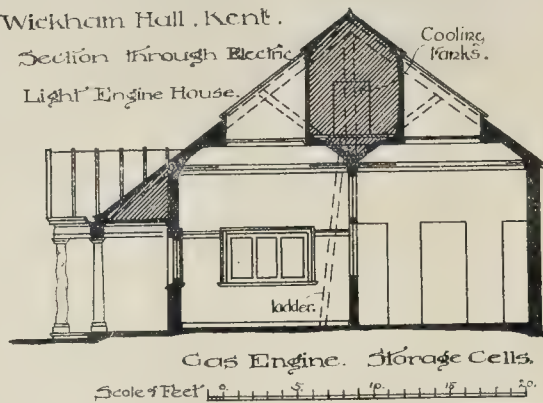
The other works, not shown, are large winter-garden, the alterations and additions to the kitchen offices, enlarged dining-room, new bay-windows, &c.

The stable offices, lodges, and dairy have either been rebuilt or remodelled.

Extensive ranges of glass have been erected,

Wickham Hall, Kent.

Section through Electric Light Engine House.



and new gardens formed about half-a-mile from the mansion.

A complete electric-light installation, a new system of drainage, and a new water supply are part of the improvements.

The drawing was exhibited at the Royal Academy of this year.

WILLIAM WALLACE.

COMPETITION DESIGN FOR HAMPSTEAD PUBLIC LIBRARY.

THIS design was one submitted in a limited competition, at the request of the Commissioners of Public Libraries for Hampstead, the estimated cost to be about £8,989—the reading-room to accommodate seventy-two people, the lending library forty-two.

A book-store and various offices were arranged for in the basement.

The design is by Mr. Horace Field, and the drawing was hung in the last Royal Academy Exhibition.

HOUSE AT LOWESTOFT.

THE plan of this house is shown on the sketch. The first floor contains six bedrooms and two dressing-rooms, and the attic two rooms.

The materials will be red brick for the lower part, rough-cast on the first floor coloured with ochre, and the roofs covered with green slates. The walls of the ground-floor portion will be hollow.

The site is on the cliffs at Lowestoft, and the sea-front of the house will face south-west.

Mr. Arthur C. Blomfield is the architect.

ELECTRIC LIGHT ENGINE-HOUSE. WICKHAM HALL.

THIS building accommodates the installation for lighting the above-named house, which was illustrated in our issue of November 10, 1894. The walls are lime rough-cast externally with salt-glazed brick quoins and arches. Internally they are faced with colour-glazed bricks. A fixed partition of wood and glass separates the engine-room from the cell-room—the latter being reached by the covered way outside, to cut off the fumes of the acid. The colonnade is executed in wood, painted white, with some old spiral columns worked in. Messrs. Massey & Alpress were the consulting engineers, Messrs. Candler the builders, and Mr. Walter Millard the architect.

The perspective drawing is by Mr. A. E. Perkins.

PRIVATE BILLS, SESSION 1896: AND DEPARTMENTAL PROVISIONAL ORDERS.

AN unusually large number of measures have been prepared for the coming Parliamentary Session. It is stated in the *Times* that there are 62 railway Bills as compared with 51 of last year, and that 114 relate to water, gas, and electrical lighting, whilst 15 out of the remaining 82 deal with tramways. We give below an epitome of the more important projects, as detailed in the official "Notices" published in the *London Gazette* :—

MUNICIPAL, BUILDING, SANITARY, AND OTHER LOCAL IMPROVEMENTS.

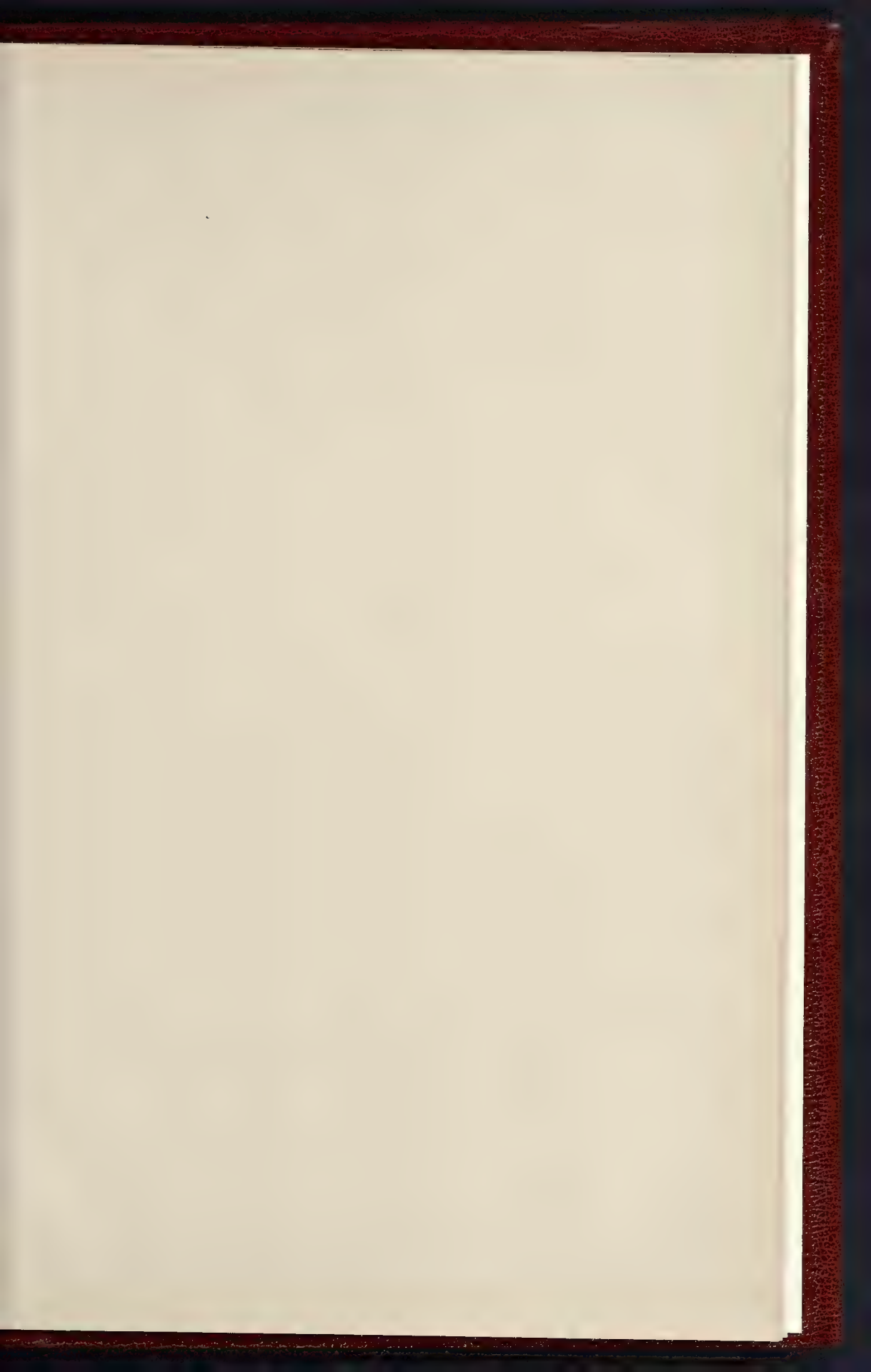
BILLS.—*Westminster Improvements (Parliament-street, &c.)*: to vest in a company the

powers conferred by the Westminster Improvements Acts of 1887, 1890, and 1892; extension of time and revival of powers for completion of the works; further lands between St. James's Park and Parliament-street, and Charles- and Great George-streets; to stop up Delahay-street; and for a new street instead to join Charles- and Great George-streets, on the west portion of the ground.* *James-street Area (Kensington Improvements)*: two new streets from Kensington-square, south-east corner, to Kensington Court and the west end of St. Alban's-road; widening of Charles-street and west end of St. Alban's-road. *Petersham and Ham Lands and Footpaths*: To what we have already said (pp. 385-6 ante) about the arrangement between the Dysart Trustees and Richmond Corporation we may here add that the Bill vests in the Conservators of the Thames and the Trustees the tow-path along the Surrey side of the river between Petersham and Teddington Lock, empowers the Trustees to relinquish all rights in Ham Common, which it vests in the Urban District Council of Ham for public use and enjoyment, and extinguishes lammias and other commonable rights, with compensation, over certain lands in the two parishes.

By the following Corporations :—*Brighton*: two retaining walls between Madeira-road and Paston-place, about 1,000 yards, and one eastwards thereof, to the parish boundary; swimming and other baths; to open North Steine Enclosures as a public walk or pleasure-ground; provisions with respect to slaughter-houses, and purchase thereof, infectious diseases, insanitary and condemned dwellings; advertisements in streets and on hoardings; the re-erection and roofing of buildings and their conversion into dwelling-houses or change of character of the same; and for prohibiting the use of steam or mechanical musical instruments or whistles or horns within or near the borough. *Darlington*: extension of boundaries to include Blackwell and portions of Cockerton and Haughton-le-Skerne; transfer of Northgate, Cockerton, Mowden, Haughton, and Church-end Bridges; improved water supply, and building regulations; regulation of overhead wires, posts, and apparatus; regulation and prohibition of street processions, the sounding or playing of musical instruments, and of singing in the streets, and prevention of street cries; purchase of the Stockton and Darlington Street Tramways Company; exemption of the Edward Pease Public Library, the Technical Institute of the Corporation, and the public parks from rates and assessments. *Stafford*: conversion of all pall-closets, privies, and the like into water or slop-water closets or other closet accommodation on the water carriage system, with further and better provision in respect of sewerage, drainage, and sanitation. *Huddersfield*: for tramways; street widenings and improvements; sanitary regulations, including the removal or filling up cesspools and ashpits, the conversion of tub-closets and privies into water-closets, and to compel the use of the water-carriage system of drainage in all new buildings; to further provide for the prevention of the

* In our "Note" of November 30 (p. 391, ante), we mentioned how the Government propose to deal with this site.

† The Association for the Suppression of Street Noise has drafted a Bill to provide relief for places where by-law are not or cannot be in operation.

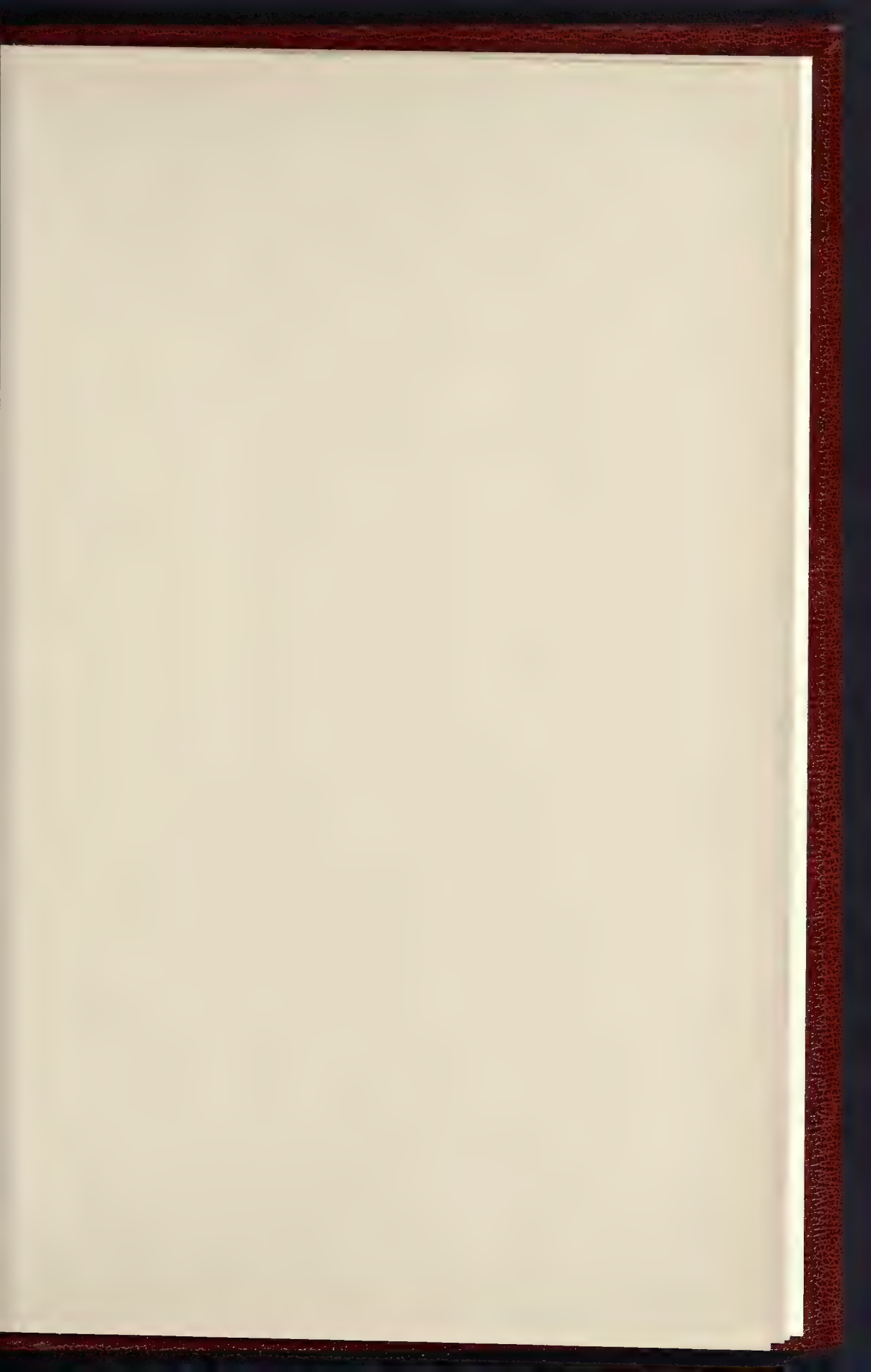




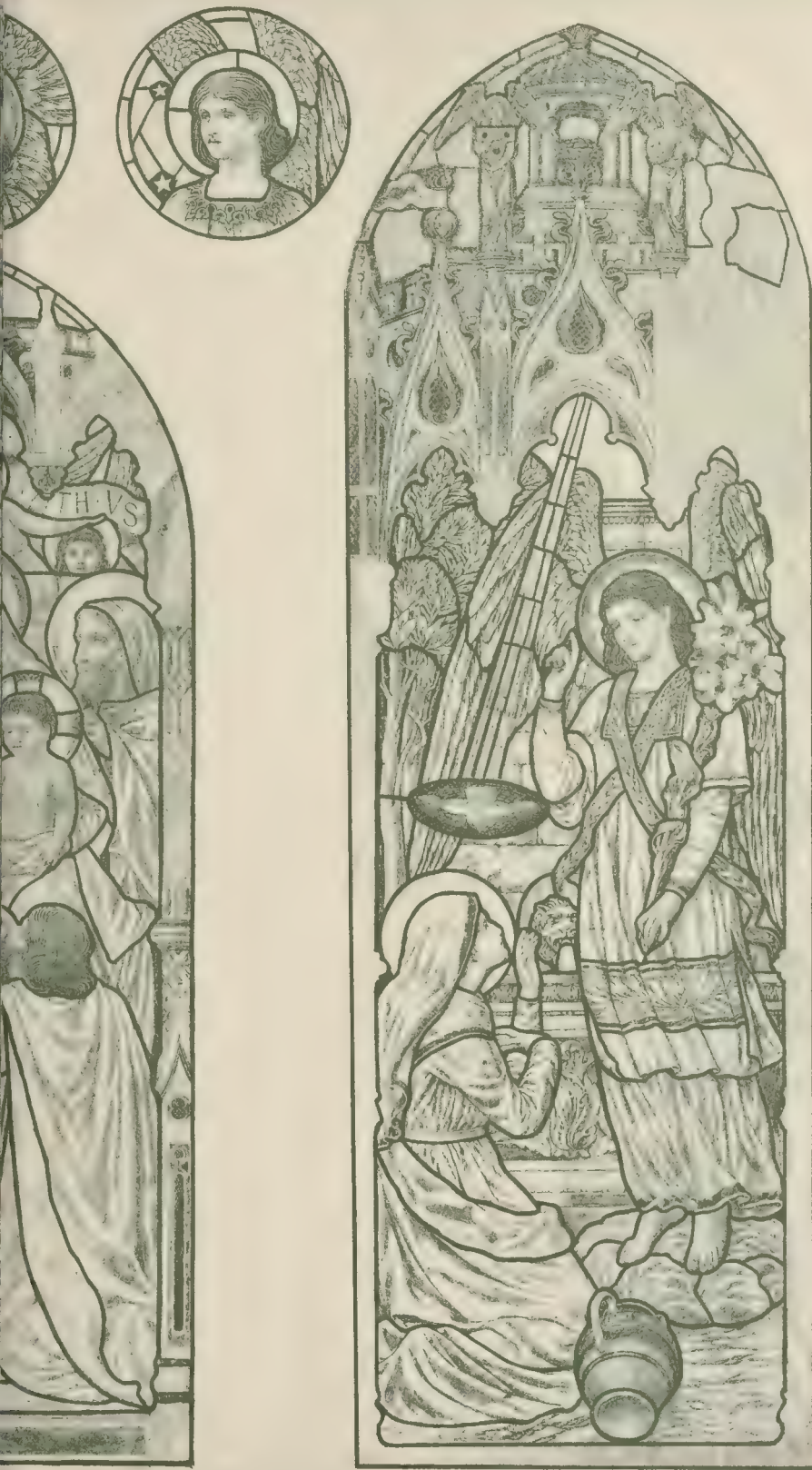
"PHILIPHAUGH," SELKIRK

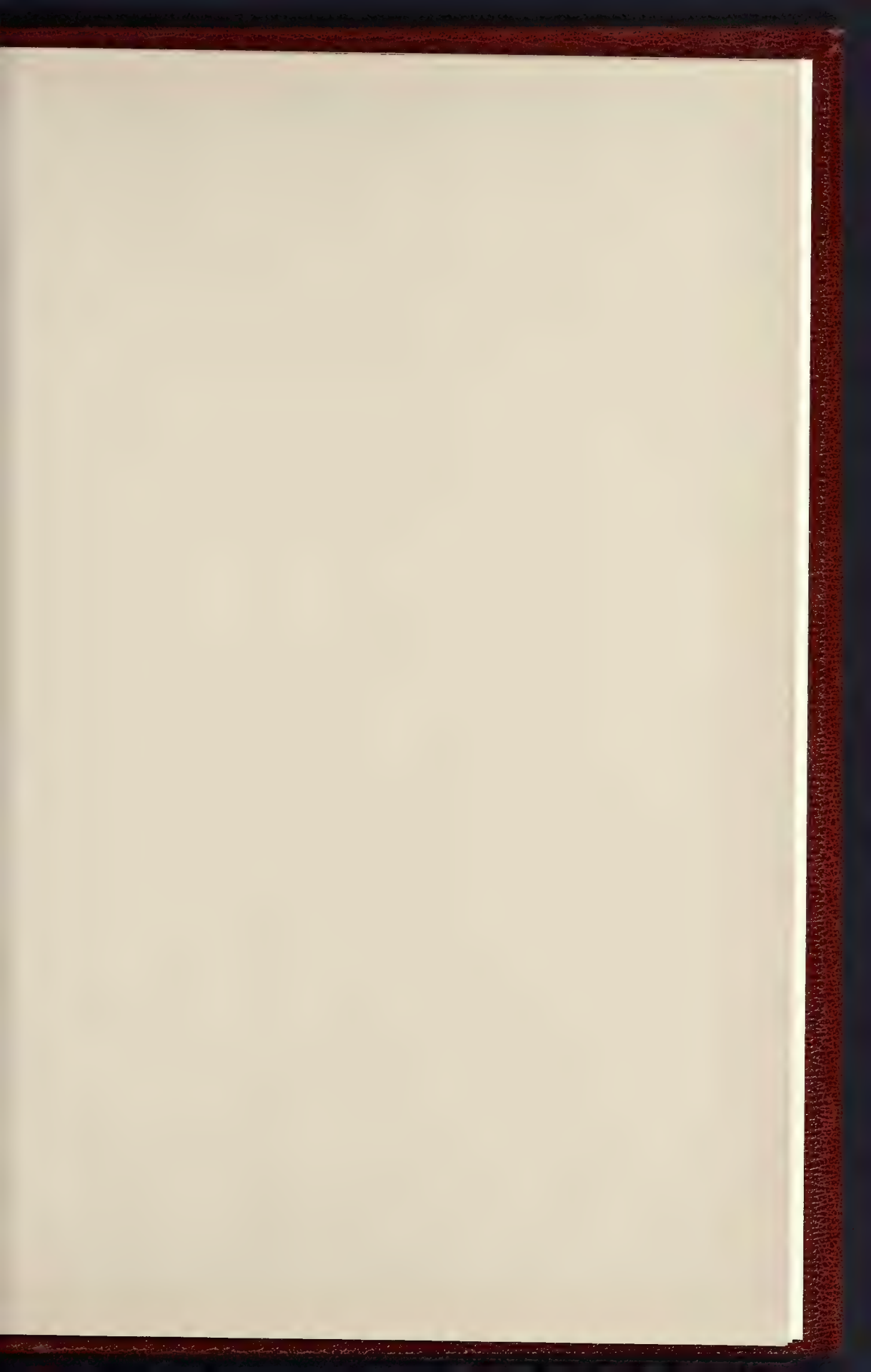


PHOTOGRAPH OF THE BUILDING EAST ALONG STREET FLETTER LANE

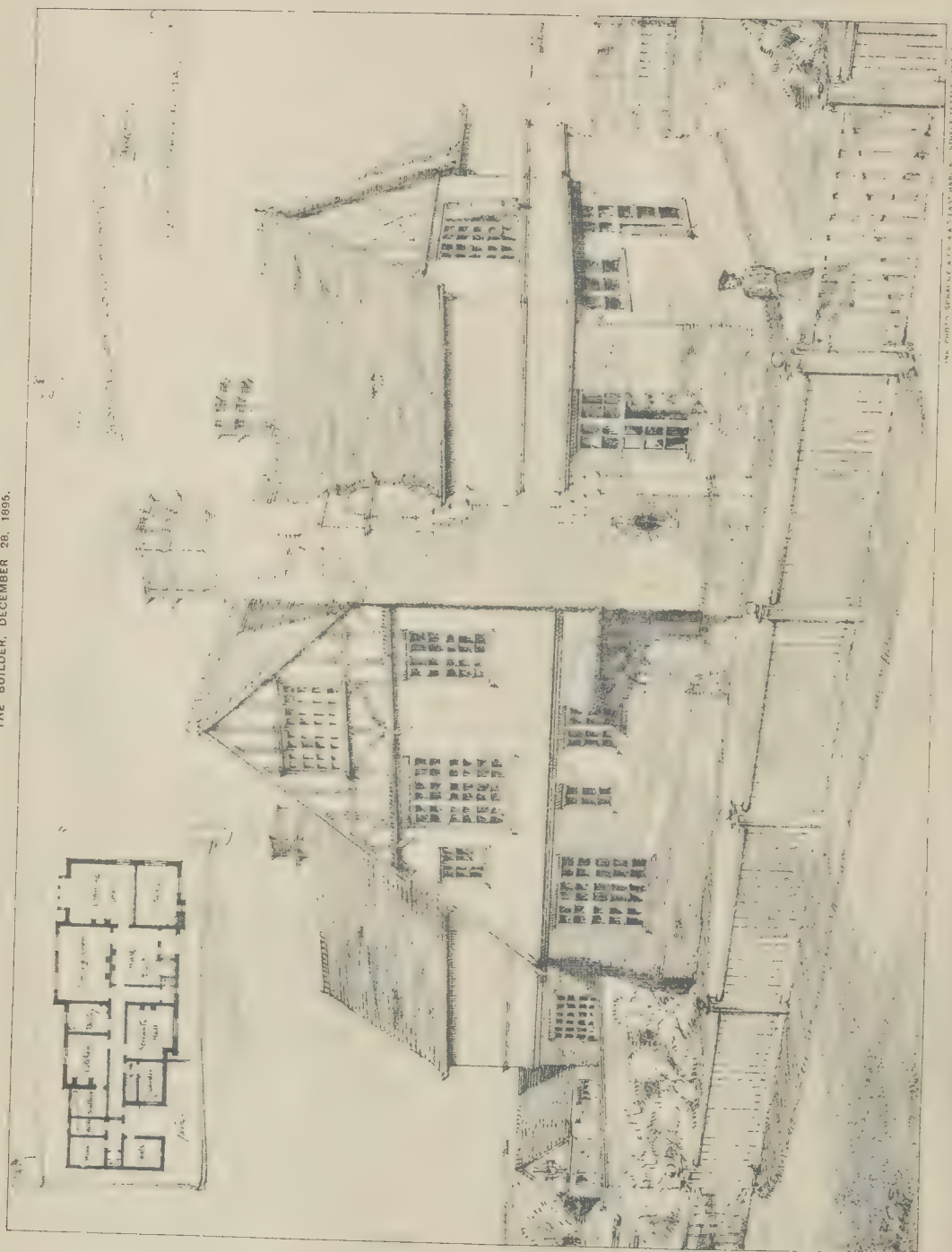






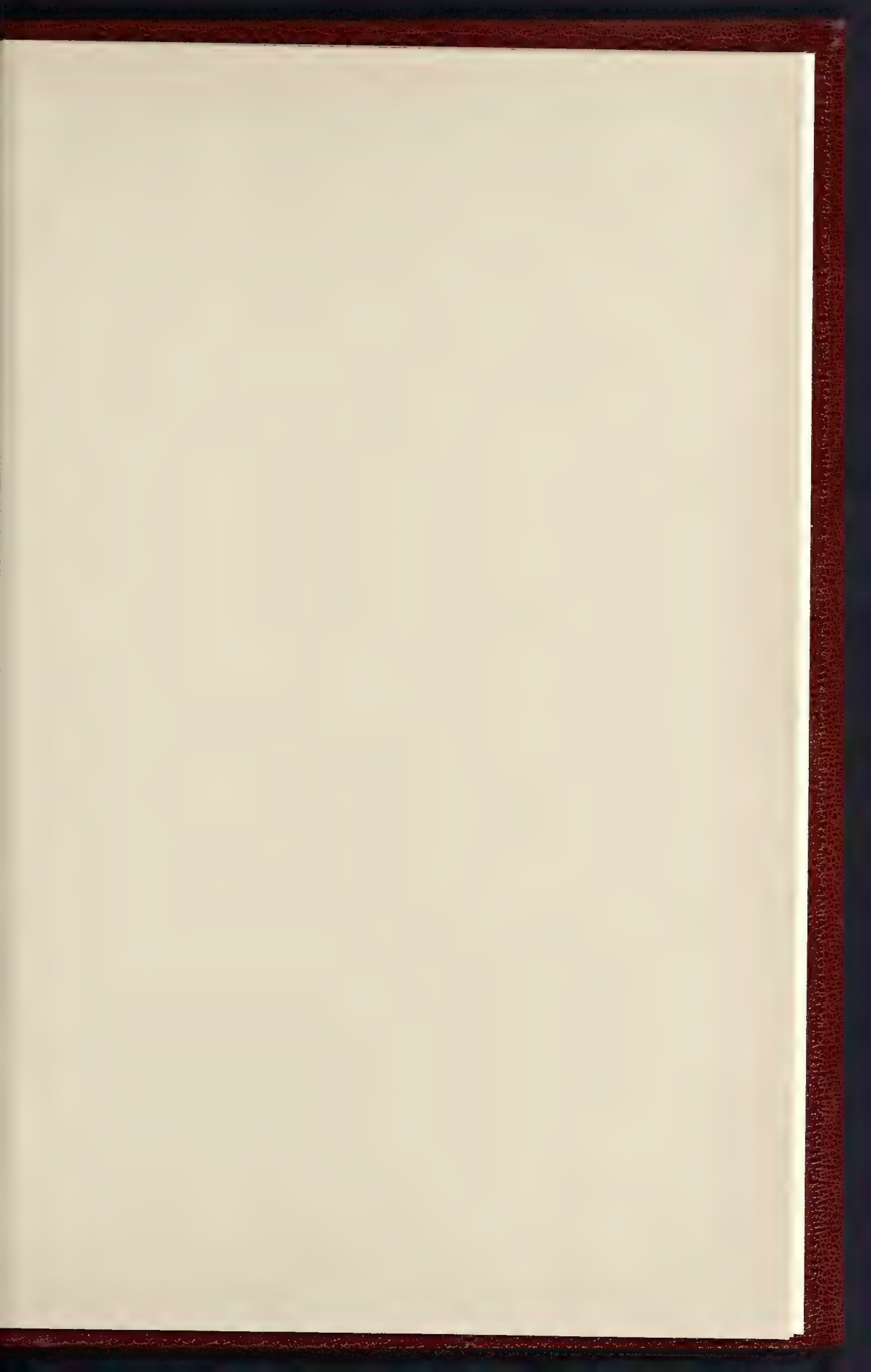


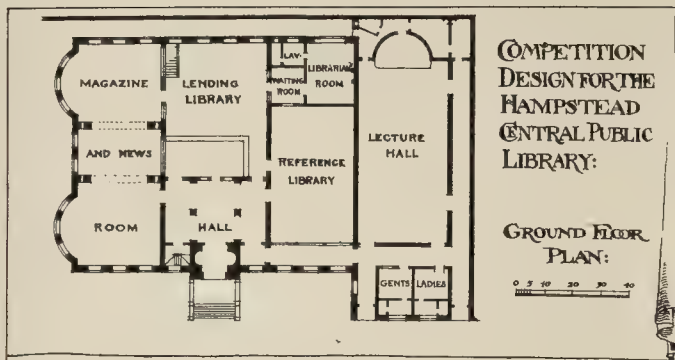
THE BUILDER, DECEMBER 28, 1895.



WICKHAM HALL, KENT. G. MELLIN Esq.
ELECTRIC LIGHT ENGINE HOUSE
Walter Millard Archt









House Hill

leading of infectious diseases by, *inter alia*, books issued from public libraries, and for concerns with respect to vendors of ices and the materials they use: to prohibit the suspension of electric wires over, across, or along any street, and to compel the same being placed underground, for the compulsory removal of those at present existing. *Manchester*: various street improvements; widening of Market-street, Crumpton, and Ashley-lane; to take over Monsall Lane in Newton; and to transfer Farnington Carrington townships from district of supply to North Cheshire Water Company to that of Corporation. *Burton-on-Trent*: to take over maintain Burton Bridge as a borough bridge; and improve Little Burton Bridge; publishing places on the Trent; certain sanitary measures; and to enable the Corporation to maintain their organ in the Town Hall, and appoint pay the organist. *Chester*: a weir or tidal across the Dee, dredging powers, prevention of pollution of river above the weir, and to raise, lower, or alter the present causeway. *King's*: to cover over the Mill Fleet between the Bridge and the London-road; new sewerage works; and to empower them to fix the level of ground floor of any new building, and protect the construction of any cellar or basement in any such building. *Leamington*: to take over the Jephson Gardens as pleasure grounds; regulations as to street musicians, betting in public streets, and sky signs, advertising vehicles and hoardings. *London*: the following Urban District Councils: *London-super-Mare*: to purchase the entire under-lying (with the island) of the company known as "Knightstown, Weston-super-Mare"; construct marine lakes in the bay by means of sea-walls, and a pier about 1,130 yards long; widen extend Marine Parade; regulations as to dings, organs, or other musical instruments used by steam, music and singing in the streets, tests for drains, advertising vehicles, sinks drains for dwelling-houses, burning of refuse, removal of offensive urinals, and requiring persons engaged in washing or mangling clothes to furnish of their customers. *Bilton, Staffs.*: extension of area of water-supply; "to restrict, license, regulate advertising hoardings, sky signs, advertising vehicles; to prohibit indecent advertisements on walls and hoardings, and to make provision in regard to street advertisements," to make further and better provision in regard to prevention and spread of infectious diseases other sanitary matters and things. *Wallasey*: to take about 6½ acres of foreshore of the Mersey; a promenade and embankment between the pier promenade and the "Ferry" Hotel, Newton; and lay out gardens and open spaces. *W. Glamorgan*: to take over Cadocton station, 28 acres, and lay it out as a park or recreation ground; extension of limits of gas and water supply; new waterworks; licensing of boats. *St. Anne's-on-the-Sea, Lancs.*: provisions similar to the foregoing; also for the payment of boatmen for the protection of passengers, prohibiting the exposure of clothes for sale for purposes in front of houses and streets, and the placing stalls, &c., outside shops, and the hanging of notices, placards, &c., outside windows. *W. Glamorgan*: to extend district by inclusion of 228 acres of Cradley, Herefordshire, and include such part of Cradley within the area of county of Worcester; construct new water-works, having reservoirs and filter-beds, in all, Mathon, and on the Malvern Hills, for which it is proposed to take about 23 acres of hills in the parishes of Mathon, Colwall, Cradley. *Caerphilly*: a Bill (by Mr. David Lloyd) for erection of new markets and slaughter-houses in Caerphilly, and purchase thereof by the Urban District Council. *Newcastle-on-Tyne*: for rebuilding of Redheugh Bridge, which joins Gateshead and Gateshead.

NAVIGATION: HARBOURS, DOCKS, PIERS, CANALS.

London.—*Comes*: to incorporate a body of Commissioners or Trustees for the management, maintenance, and improvement of Cowes Harbour, to be appointed by the Urban District Councils of the Isle of Wight, Newport Corporation, Royal Yacht Squadron, Royal London Yacht and Southampton, Isle of Wight, and of England Royal Mail Steam Packet Company. *Borrowstounness Harbour Commission*: to sell and transfer their existing undertaking for a harbour and docks to the North British Railway Company. *Swansea Harbour*: to give new entrances to the half-tide basin in the Town Float, with new lock, and for

deepening. *Brading Harbour and Railway*: to determine limits of harbour; to make a new cut, with quay wall. *Windsor Docks, Cardiff*: a company for sea-walls, docks, railways, &c., on the Penarth Flats. *Preston Corporation (Ribble Navigation)*: training walls, or embankments, at Lytham, in the estuary of the Ribble. *Midland Railway*: a harbour at Heysham, Morecambe Bay, with two piers, about 1,100 yards and 1,130 yards long, at the Near Naze, and Red Nab, with a jetty, about 430 yards long. *Llanelli Harbour and Burry Navigation*: embankments or training walls, a new dock and cut for the River Lleidai, railways in Llanelli parish.

PROVISIONAL ORDERS, BOARD OF TRADE.—

Portsmouth (Pembroke-shire): a wet dock in the harbour, with refreshment rooms, shops, and approaches, near the harbour. *Studland (Dorset)*: by Mr. W. Ralph Bankes, of Kingston Lacy, Wimborne, for a pier, about 500 yards long, with other works. *Tenby Corporation*: a pier, jetty, or landing-stage, near Castle Hill. *Birchington*: a pier, about 1,000 yards long, with a cross-head 70 yards long. *Weston-super-Mare*: to lengthen the present jetty; and a pier about 390 yards long, from the west end of Birnbeck Island. *Bechill Promenade and Landing Pier*: by Mr. John William Webb, for a promenade and pier, about 1,400 ft. long, westwards of the Coastguard Station, with assembly rooms, shops, baths, and the like.

BILLS.—Manchester Ship Canal: filling up of some tidal openings; railway on the Irwell tow-path, between Trafford-road and the Ordsall Soap-works; diversion of discharge of river Weaver into the Mersey; an embankment, about 650 yards long, by side of Norton Marsh; and to extend time for completing Warrington Dock. *North Metropolitan Railway and Canal*: a new street to join Medland and Narrow-streets, Ratcliff; new locks at Salmon's-lane, Limehouse; to deepen the canal between Salmon's-lane and Regent's Canal Dock, widening in Limehouse, and at Park-road, St. John's Wood; rebuilding of the Commercial-road East and Salmon's-lane bridges.

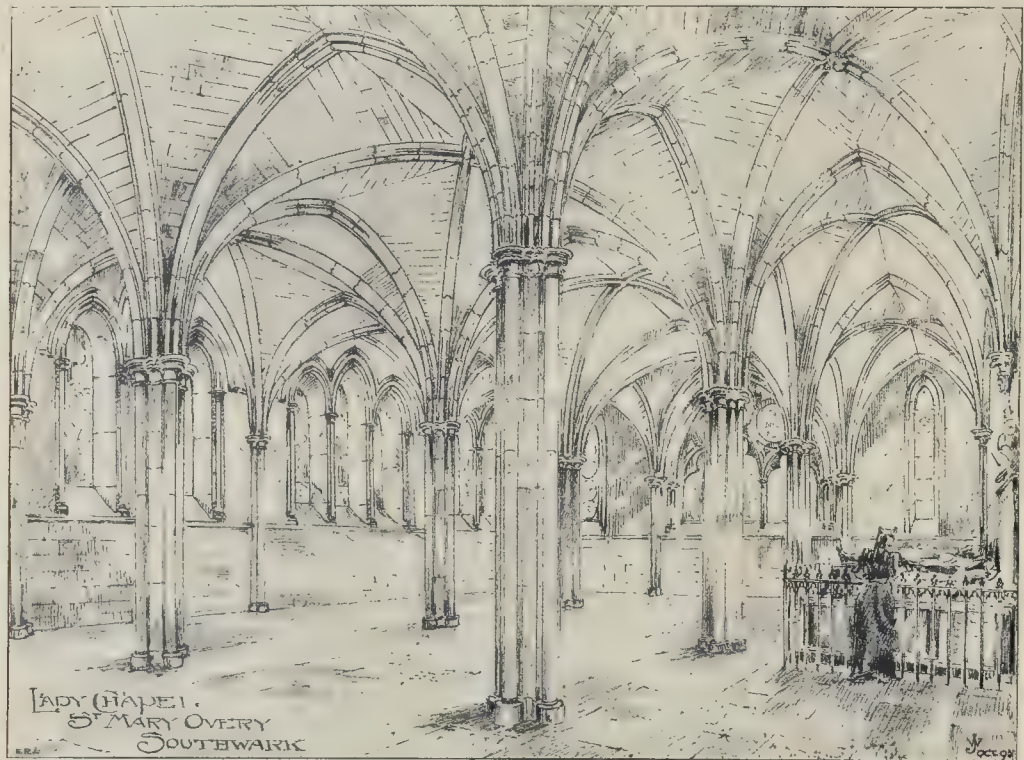
RAILWAYS.

BILLS.—London and South Wales: a line from the Barry Railway, Cardiff, to the Metropolitan at Great Missenden (Bucks), and the Midland at Hendon, passing through Newport, Chepstow, Kempsford, Lechlade, Malmesbury, Cricklade, Castle Eaton, Cumnor, Bampton, Stanton Harcourt, Cowley, Ilfley, Oxford, Cuddesdon, Bledlow, Princes Risborough, and Great and Little Hampden, with a branch from Bledlow to Wycombe, Beaconsfield, Chalfont St. Peters, Denham, Harefield, Ruislip, Pinner, Harrow, and Hendon, and connecting lines with the Manchester, Sheffield and Lincolnshire, Taff Vale, Brecon, and Merthyr Tydfil, Great Western, Midland, and Midland and South-Western Junction Railways. *Metropolitan District*: a line from South Kensington Station to the junction of Pelham-street with Fulham-road, and stopping-up of Pelham-crescent and Pelham-street. *Metropolitan*: to widen their lines in Harrow and Aylesbury parishes, reconstruct their joint station with the Great Western at Aylesbury, enlarge Moorgate-street Station, and acquire lands for making openings to ventilate their line, at and between Gower-street and Praed-street Stations. *Baker-street and Waterloo*: extension of time under their Act of 1893, and a railway (electric or cable) from Upper Baker-street to the Manchester, Sheffield and Lincolnshire line, at Harewood-square, N.W. *City and South London*: extension of time under the Act of 1893, additional lands on each side of Borough High-street, and to alter the construction of the Lombard-street Station. *Watford, Edgware and London*: a company for a railway from Watford (London and North-Western) to Edgware, with branches to Mill Hill Station (Midland) and Edgware Station (Great Northern), passing through Bushey, Aldenham, and Little and Great Stanmore. *Ealing and South Harrow*: lines from their authorised railway in Harrow to Hillingdon, Beaconsfield and Wycombe; to Willesden; and to join the Regent's Canal, City and Docks railway at Warwick-road, Paddington, taking about ten acres of the common lands known as Wormwood Scrubs and the adjacent Old Oak Common. *Ilford, Barking-side and Chigwell Row*: to incorporate a company for railways from Ilford (Great Eastern) to Chigwell Row, and to Townswood Hill in the grounds of the London County Asylum at Claybury. *South Eastern*: to widen portions of their London and Suburban railways, including the Charing Cross line, and at Rotherhithe and Deptford. *Great Eastern*: a line from North

Walsham (on their East Norfolk branch) to join the authorised Mundesley branch of the Midland and Great Northern Companies at its crossing of Antingham-road in that parish. *Great Western*: new Lines in Denbighshire to join their Shrewsbury and Chester Railway at Ruabon, with the Shropshire Union, and their Legacy Colliery Branch Railways: to take about nineteen acres of common land in Hawkesbury and Old Sodbury parishes, Gloucestershire, for four lines from Wootton Bassett to Old Sodbury, and Berkeley New Docks Branch, from Old Sodbury to Patchway on their Bristol and South Wales Union, and from Stoke Gifford (on the last-named new line) to Filton on the said Union line: lines from their South Wales railway (Pengam level crossing) to Roath Dock, and the Roath branch of the Taff Vale Railway; a viaduct and embankments at Bickleigh; and, conjointly with the Midland, a line, in the Forest of Dean, from the Severn and Wye railway to the Iron Works, Cinderford (three Bills). *London, Brighton, and South Coast*: a line in Deptford for crossing Grove-street Hill on the level; to widen their Croydon and Balham line between Streatham and Croydon, and their Wimbledon and Croydon line between West Croydon and Merton Park Stations; and, conjointly with the London and South Western, enlarge Portsmouth Harbour Station, and extend the carriage-way to join the floating pontoon. *Portsmouth, Basingstoke, and Godalming*: a line from Monk Sherborne on the Reading and Basingstoke branch of the Great Western, to Basingstoke, Hambledon, Bedhampton, Portsea, and Portsmouth; a line from Shalford, Surrey, to East Tisted, county Southampton, through Guildford, Godalming, Hedley, Selbourne, and Newton-Valence; for these it is proposed to take about twenty acres of Hankley Common, in Elstead, with fifteen acres of lammas lands at Godalming, and to stop up several streets in Portsea and Portsmouth. *West Grinstead and Haywards Heath*: a line from West Grinstead Station (London, Brighton, and South Coast) through Cowfold, Twineham, Bolney, Lindfield, Hurstpierpoint, and Cuckfield, to a junction with the latter railway at Haywards Heath. *Rother Valley*: a light railway from the South-Eastern at Salehurst, Sussex, through Ewhurst, Northiam, Newenden, and Rolvenden, to Tenterden. *North-Eastern*: a line from Killingworth on their Newcastle and Berwick Railway to Gosforth; a line from Cottingham, on their Hull and Scarborough Railway, to join the Hull, Barnsley, and West Riding Junction at Springbank-road. *Basingstoke and Wokingham*: a line from Basing (London and South-Western) to Wokingham on the Reading and Reigate branch of the South-Eastern, passing through Monk Sherborne, Sheffield, Hartley, Bramshill, Eversley, Finchampstead, and Barkham. *Marlborough and Grafton*: a company for a line from the Midland and South-Western Junction Railway at Freshute, near Marlborough, through North and South Savernake, and Wootton Rivers, to join the line at Wolfhall, and thence to Grafton Station. *Bideford, Westward Ho! and Appledore*: a company for a line to connect those places running from Bideford Bridge through Northam. *Lowestoft and Yarmouth*: a light railway from Station-road, Lowestoft, to Lowestoft, about nine miles long, passing through Southtown, Blundstone, Guntton, and Oulton. *East and West Yorkshire Union*: purchase of the South Leeds Junction, and its dissolution. Amalgamation of the North-Eastern and Hull, Barnsley, and West Riding Junction, and winding up of the latter. *Cawood, Wistow, and Selby*: a light railway from Cawood through Wistow, Selby, and Brayton to join the Leeds and Selby line at Brayton-gates, W.R. *Newport, Gadhilly, and St. Lawrence*: to extend their authorised railway by a line from Godshill to Steephill Castle grounds, Isle of Wight. *Port Talbot Railway and Docks*: several short lines in Glamorgan; purchase of the Morfa, and the Cefn and Pyle Railways; completion of the Dimbath branch of the Great Western, failing its completion by the latter, and to buy about 20 acres of common land in St. Bride's Minor and Liangeinwy parishes. *Bute Docks*: amalgamation of the Rhymney Railway Company with the Bute Docks Company, and dissolution of the former; to construct lines from Cardiff up the Taff and Aberdare Valleys, for which are scheduled 3 acres of Gelligaer and Craigavennyshon Commons.

TRAMWAYS.

BILLS.—By the Corporations of Swansea, Huddersfield, and Newcastle-on-Tyne—for new lines. Companies for twenty-four tramways in Sheffield, Rotherham, Ecclesfield, Handsworth,

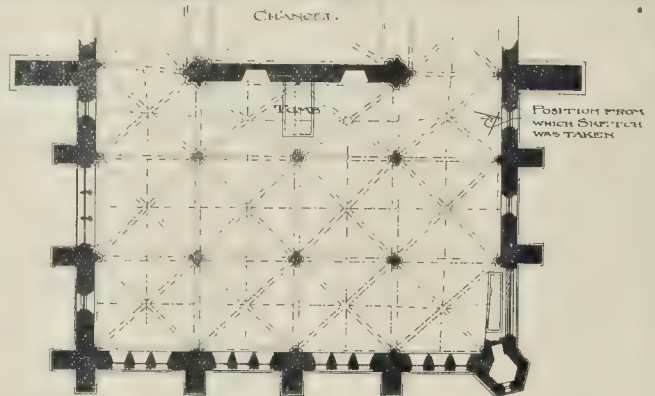


and other places; in Halifax and around; from Kidderminster to Stourport; from Derby to Ashbourne. *London Tramways*: To double their lines in Upper Kennington-lane, Brixton-road, and Camberwell New-road, and for a line from Upper Kennington-lane over the new Vauxhall Bridge, to the end of Vauxhall Bridge-road. New lines in the Blackpool, St. Anne's, and Lytham districts; for Blackpool and Fleetwood (for which the overhead system may be adopted); from Stone, through Dartford, Darenth, Farningham, and Eynsford, to Lullingstone, from Sutton-at-Hone to Wilmington, and from Eynsford to Swanley Junction Station, with a pier about 100 yards long, at the river-wall, Stone.

PROVISIONAL ORDERS, BOARD OF TRADE.—Lines in Ashton-under-Lyne and district; by the Corporations of Manchester (additional), Kingston-on-Hull, Blackpool, Dover (gauge 3 ft. 6 in.), Longton (gauge 4 ft.), and Plymouth. For street-tramways (4 ft. gauge) in Burslem, Tunstall, Stoke-on-Trent, Hanley, and the Potteries district generally; for Bristol, by the Bristol Tramways and Carriage Company; and extension through the North and South Camps and parade ground, of the Aldershot and Farnborough lines.

ELECTRICITY AND ELECTRIC LIGHTING.

PROVISIONAL ORDERS, BOARD OF TRADE.—To produce, store, and supply electricity, electrical energy and power by the Corporations of Bangor, Bath, Devonport, Folkestone, Gloucester, Godalming, Huddersfield (extended area), King's Lynn, Liverpool, Manchester (extended area), Margate, Middleton, and Wells; St. Mary, Newington, and Battersea Vestries; the Urban District Councils of Colwyn Bay and Colwyn, Cowes, Keswick, Kettering, and Sale, co. Chester. By the following companies: *County of London and Brush Provincial*—within the Districts of St. Saviour's Board of Works; St. Mary, Newington; St. Mary, Lambeth; St. Giles, Camberwell; and St. Mary, Battersea; Lincoln, and Ipswich. *J. C. Howell*: Merthyr Tydfil. *Newmarket Electric Light*: Newmarket. *Liverpool District Lighting*: Allerton, Little Woolton, Much Woolton, Childwall, and Garston, Lancashire; Great Crosby and Waterloo-with-Seaforth. *British Insulated Wire Company*: Prescott and Whiston districts. *Windermere and District Electricity Supply Company*: Ambleside. *Ilfracombe Gas Company*: Ilfracombe. *Guildford Gas Light and Coke Company*: Guildford. *Bournemouth Gas and Water*: Bournemouth and vicinity. *Bexhill Water and Gas*: Bexhill and neighbourhood. *Bedford Electric Light Company*: Great Berkhamstead and Northchurch. *City of Bath Electric Lighting and Engineering*: City of Bath. *Great Western Electric Light and Power*: in the Urban Districts of St. George, Kingswood, and Stapleton, and the Rural District of Warmley, Bristol. *Altrincham Electric Supply*: parish of Ashton-on-Mersey. *Keswick Electric Light*: in Keswick and parts of other townships in parish of Crosthwaite.



Lady Chapel or Retro-choir, St. Mary Overy.—Plan.

Ilfracombe Gas Company: Ilfracombe. *Guildford Gas Light and Coke Company*: Guildford. *Bournemouth Gas and Water*: Bournemouth and vicinity. *Bexhill Water and Gas*: Bexhill and neighbourhood. *Bedford Electric Light Company*: Great Berkhamstead and Northchurch. *City of Bath Electric Lighting and Engineering*: City of Bath. *Great Western Electric Light and Power*: in the Urban Districts of St. George, Kingswood, and Stapleton, and the Rural District of Warmley, Bristol. *Altrincham Electric Supply*: parish of Ashton-on-Mersey. *Keswick Electric Light*: in Keswick and parts of other townships in parish of Crosthwaite.

WATER SUPPLY.

BILLS.—*London Sea-water Supply*.—A new company for conduits, reservoirs, pumping-

stations, and other works between Lancing, in Sussex, and London. The intake will be at Lancing, the reservoirs at Lancing, Bramber, and Epsom. The lines of pipes, with several conduits on the way, will pass through the parishes, townships, or extra-parochial and other places following, namely: Sompting, Bramber, Steyning, West Grinstead, Horsham, Dorking, Mickleham, Leatherhead, Epsom, Ewell, Cheam, Sutton, Wimbledon, Mitcham, Tooting, Streatham, Clapham, Battersea, Chelsea, Kensington, St. George, Hanover-square, St. Martin-in-the-Fields, St. James, Westminster, St. Clement Danes, the Temple, St. Bride, St. Sepulchre, St. Botolph (Aldersgate), St. Luke, Shoreditch, Bethnal Green, Paddington, St. Marylebone, St. Pancras, St. George, Blooms-

bury; St. Andrew, Holborn, Gray's Inn, Hatton Garden, and Clerkenwell. The seawater will be conveyed under the Thames by a conduit from Battersea Bridge-road to the intersection of Cromwell-road with Queen's-gate. There will be conduits at Holland Park-avenue, Mount-street, Snow Hill, Victoria Park (Bonnor Hall Bridge entrance), Portman-square, Queen's-gate (north end), Northumberland-avenue (north end) and at the junction of Great College-street with Abingdon-street, Westminster. *New River Company:* new wells, pumping-stations, aqueducts, and lines of pipes in the parishes of Ware Rural, Stapleford, Twinn, Essendon, St. John Rural, Great Amwell, Little Berkhampstead, Bayford, Brickendon, Hoddesdon, Enfield, Chessunt, and Edmonton. There are to be new reservoirs at Enfield Chase, Southgate, and Wood Green; new filter-beds and a pumping station in Stoke Newington; the New River is to be widened on both sides at several places along its course, and the company propose to take an aggregate estimated at thirty acres of common land known as the King's and Hartham Meads, in the parish of St. John Urban, Hertford. They will also discontinue, as a waterway, the water-way in Enfield and Edmonton, between Southbury-road and Bush Hill sluice, diverting the water into the main channel, and enlarge their reservoir, by the pond, on Hampstead Heath. *East London Waterworks:* The London County Council promote a Bill to make further provision with respect to the supply by this company, and for securing more regular and constant supply at a higher level. *Kent Water Board:* a water board for the Urban Districts of Beckenham, Bromley, Dartford, Erith, and Bexley, with the Rural Districts of Bromley, Dartford, and Sevenoaks, the purchase by such board of the Kent Waterworks Company, and the vesting in them of so much of the Lambeth Company as is situated in Kent (Beckenham). This Bill formulates the policy advocated by the local authorities concerned when opposing, last session, the London County Council (Water Transfer) Bills. *Staines Reservoirs:* a joint committee nominated by the proprietors of the New River, West Middlesex, and Grand Junction Companies, for various purposes, to include two reservoirs at Stanwell, and one (about seven acres in area) at Hampton, a pumping-station in Stanwell, and to take about twenty acres of common lands in Staines parish for aqueducts from Weyardsbury to Hampton, and in Staines.

ADDITIONAL WORKS AND EXTENSION OF AREA OF SUPPLY.—Portsmouth, Huddersfield, Eastbourne, Brighton, and Sheffield (for Barnsley, Rotherham, and Doncaster) Corporations; and the following companies: Southwark and Vauxhall, East Surrey, Eastbourne, Bournemouth, Aldershot, Bexhill, East Warwickshire, Fyde, Aldington Estate, West Brighton, and Ystrad; which last-named company propose to utilise Llynfawr Lake, at Rhigos, and to take 120 acres of Forest Fawr and seven acres of Hirwain common land. The Birmingham Corporation promote a Bill for more lands and deviations of the authorised aqueduct.

PROVISIONAL ORDERS, BOARD OF TRADE.—New companies to supply the Laindon Hills district; Amersham, Beaconsfield, Chelms, Chalfont St. Giles, and around; and to Mr. J. T. Green, of Amphil, for Amphil, Maulden, and around.

GAS.

BILLS.—*Sandwich Corporation:* and to purchase the Sandwich Gas Light and Coke Company. *Cheltenham Corporation:* extension of area of supply, and purchase of the Cheltenham Gas Light and Coke Company. By the following companies: Bournemouth Gas and Water, Ilfracombe, Bexhill Water and Gas, Newcastle-on-Tyne and Gateshead, and Cheltenham Gas, for additional works and extension of areas.

PROVISIONAL ORDERS, BOARD OF TRADE.—Matlock Bath Gas Light and Coke, new works and extension of area. **LOCAL GOVERNMENT BOARD.**—*South Molton Corporation:* to buy and work for heating and motive power the undertaking of the South Molton Gas and Coke Company. *Great Driffield:* to authorise the District Council to acquire the Driffield Gas Light Company, and extend the existing works. The Urban District Council of Matlock Bath and Scartham Nick apply for a Bill for gas-supply, and purchase of the Matlock Bath Gas Light and Coke Company.

* With purchase of the Eastbourne Waterworks Company.
† They also apply to the Local Government Board for a Provisional Order to this intent.

THE LADY CHAPEL OR RETRO-CHOIR, ST. MARY OVERY.

THE restoration of the Retro-choir (commonly, but erroneously, called the Lady Chapel) was carried out by Gwilt in 1832, and is a remarkably good specimen of such work at that date.

It is to be regretted that externally a Yorkshire stone was used which has proved to be very ill-fitted to withstand the influence of London air, and that internally so much of the repair was executed in cement and plaster, and the old chalk filling in of the groining entirely hidden under a coating of the latter, marked with lines in such a manner as to rob the old groining of much of its charm. These defects in the interior have now been remedied. The Lady Chapel (latterly called the Bishop's Chapel, the tomb of Bishop Lancelot Andrews being the principal feature in it), stood eastward of the second bay to the south; the lines of the jambs of the arch from the Retro-choir can still be seen. When it was pulled down the tomb of the Bishop was moved into the position it now occupies at the back of screen behind the high altar.

It is now proposed to move it to a more suitable position under the easternmost arch of the south aisle of the choir.

At the north-east corner of the Retro-choir are the remains of what is supposed to have been an Easter sepulchre.

The floor of the whole is about 12 in. above the ancient level, which, for several reasons, it was impossible to restore in the works now going on.

Correspondence.

To the Editor of THE BUILDER.

ELECTRIC LIGHT SUPPLY.

SIR,—I have read with interest your notes on the Edinburgh Electric Lighting Works, especially those relating to the introduction of high voltage lamps. The gain to the supplying agents is manifest. The gain to the consumer is, to say the least, doubtful, and where corporations or vestries undertake the work, I think the latter deserve some consideration. This house is supplied by the St. Pancras Vestry, but though the mains were laid several months before I adopted the light, no notice was sent of any intended change in the conditions of supply, and the house was partly wired as for 110 volt lamps, when I found out the change. Unlike Edinburgh, there was no option in the matter, or most certainly I should not have agreed to use the higher pressure. The candle-power does deteriorate more rapidly (unless that is, the Vestry do not maintain the proper voltage in their mains), and I have had to change some after about 500 hours' use. There are other drawbacks to their use besides the higher charge (English lamps are 2s. each.)

There are no five c.p. lamps to be had; there are no obscured lamps yet made. The lamps are larger than the 110 and 200 volt lamps, and will not go in many shades.

The meters are not specially made for the higher voltage, though this may be after all no real objection. "ST. PANCRAS."

P.S. I enclose card.

PORTLAND CEMENT IN HONG-KONG.

SIR,—I am sending you, attached to this letter, the results of several tests of Portland cement manufactured in Hong-Kong by the Green Island Cement Company.

This being a new and comparatively unknown brand, it occurred to me that these results might be useful to your readers in India and the Far East, who, like myself, have hitherto preferred to use the better-known English brands to a local manufacture of which we know so little.

At present I believe the price in Singapore is about the same as home-manufactured cement, but with an increased demand it should be cheaper, especially in China.

The tests were made by Mr. J. W. B. MacLaren, A.M. Inst. C.E., and myself, from a recent consignment, the cement being taken from different casks as they stood in the godown.

REGENT A. J. BIDWELL.

Singapore, November 16, 1895.

No. of Brick.	Date of Making.	Date of immersion in water.	Date of Test.	Area of Brick.	Broke under a tensile strain of	Quantity of Water.	Remarks.
1	Nov. 4	Nov. 5	Nov. 12	1-in.	425 lbs.	Very wet.	Set quickest.
2	"	"	"	"	520 "	"	"
3	"	"	"	"	461 "	Less water.	"
4	"	"	"	"	340 "	Less than 3.	"
5	"	"	"	"	385 "	"	Slowest set.
6	"	"	"	"	360 "	"	Fracture showed signs of foreign matter.
7	"	"	"	"	450 "	More than 4, 5, & 6.	"
8	"	"	"	"	450 "	Less than 1 and 2.	"
9	"	"	"	"	479 "	"	"
10	"	"	"	"	534 "	"	Most carefully made brick.

The average weight per struck Imperial bushel was 103½ lbs.

The Student's Column.

METALS USED IN BUILDING.—XXVI.

METALLIC PAINTS.

UNDER this heading we shall give a brief review of divers mineral substances used in the manufacture of metallic paints, including also some pigments not, strictly, of metallic origin.

White Lead.—This is by far the most important pigment employed by the house-painter; it forms the base of practically all the lighter tints, and is used generally to impart a "body" to the colour. The pig-lead from which it is produced is obtained from lead-refiners, and the substance is then corroded. The most common process employed is known as the Dutch method, the essential features of which are as follow: The pig-lead is cast into perforated buckles, 7 inches in diameter, and about one-eighth of an inch in thickness. These are packed in earthenware pots of suitable size, into which a dilute solution of acetic acid is poured. The pots are then piled up into huge bins or stacks, and when the stack is completed it is covered with spent tan bark or manure, and then left alone for about thirty days. A chemical decomposition of the lead ensues in consequence of the heat generated, and some of the metallic pig becomes converted into white carbonate. On the contents of the pots being removed, the material is found to be partially lead carbonate (white lead) and partially unconverted pig lead. The mixture is thrown into a revolving drum, which retains the metallic portion and permits the white lead to pass through a screen. The quantity of pig-lead converted into white lead never amounts to more than from 60 to 70 per cent.; there is always a residuum of unconverted lead.

But the composition of white lead is by no means constant. The amount of lead oxide varies from 84·7 to 86·5 per cent., with correspondingly differing amounts of carbonic acid and water.

The white-lead of Kremnitz, Hungary, has the reputation of being the finest in the world. The process employed in its manufacture may be briefly described. The oxide of lead used if in lump must first be ground to powder. To every hundredweight of lead ten quarts of No. 24 acetic acid are added, with sufficient water to make consistent dough or paste. This is spread upon trays covered with sheet lead, which are placed one above another, provision being made for the admission of gas between each. Carbon dioxide, produced by the combustion of coke, is then admitted to the chamber, the gases being driven passing through filters formed of wet scraps of lead arresting smut, which would impair the colour of the lead. Where sulphur is suspected in the coke, the water is impregnated with some alkali. The absorption by lead oxide of the carbon dioxide present in the gas is shown by a gradual change of colour to white. The operation is complete in from three to six days, during which time the lead is stirred up by means of rakes. The material is spread in store-rooms and permitted to dry, then ground with water in a mill, floated, redried, and is then ready for use.

Zinc white.—This pigment, second only to white lead in importance, is extensively manufactured, especially in the United States. It is an artificially-prepared oxide of zinc made by a very simple process. The zinc ore is mixed with hard coal, reduced and vaporised by means of heat. A current is then passed through the vaporised zinc, and white flakes of the oxide result, which are collected in bags. In countries not possessing sufficiently hard coal, the vapour is obtained directly from bar zinc, or spelter, and freshly prepared oxide is submitted to hydraulic pressure and a considerable amount of heat at the same time. A whiter oxide results on account of no coal-dust or smoke coming in contact with the pigment during the course of production. In

-consequence of the increased demand and higher price of labour, the value of the pigment is slowly increasing in the United States.

The zinc white of Belgian origin is imported in three grades, known, respectively, as "Paris green seal," "Paris red seal," and "Antwerp red seal." These are employed in the manufacture of the better class of paints.

Barytes.—This mineral, known also as heavy spar, barite and barium sulphate is abundant in many parts of the country, and is largely used in making different paints. It is very frequently found in pockets, the extent and homogeneity of which are always unknown quantities. Consequently the quality is variable, and it requires knowledge of a very special character to gauge their relative values. The mineral is prepared in several ways, the product of one of which is known as "floated barytes." In this the ground mineral is floated in long sluice-ways and that which floats the farthest is the finest in grain. This variety of barytes is found to be much finer than that which is simply ground, but it is liable to be slightly discoloured, as it readily takes in impurities from the water with which it is treated.

Blanc fixe.—This is known also as permanent white and barytic white; it is barytes artificially prepared. The crude heavy spar is thoroughly ground and mixed with some carbonaceous material, such as coal-dust, and some chlorine compound, generally the residue from chlorine stills. This mixture is treated in a reverberatory furnace for an hour. The resulting mass is fixated, and the liquor, which is a solution of almost pure barium chloride, is drawn off and mixed with sulphuric acid. The resulting precipitate, which is barium sulphate in an exceedingly fine state of division, constitutes *blanc fixe*. It is generally sold in pulp, that is, ground in water. Its covering capacity is much greater than that of natural barytes.

Terra alba is a white pigment made of ground gypsum.

China clay, from its purity, being normally snow-white when carefully prepared, is used to some extent in paint-manufacture.

Whiting, or ground earthy carbonate of lime, is used for similar purposes. In general there are four grades of this substance, viz., common whiting, gilders' whiting, extra gilders' whiting, and (in the United States principally) American Paris white.

Paris white.—This is the name given to the white colouring substance prepared by grinding hard limestone of greater specific gravity than chalk. The rock is known technically as cliffstone.

Vermilion.—When properly so-called, vermillion is an artificial sulphide of quicksilver. A common process employed in making it consists in bringing quicksilver, sulphur, potassium hydroxide and water together in a revolving drum. The mixture is gently heated until 115 deg. Fahr. is reached; the temperature is then kept constant, and the reddening action proceeds. The composition of real vermillion is, approximately, mercury 86.3, sulphur 13.7.

A number of pigments known as vermillion are in the market under the name of "Persian red," "Persian scarlet," "American vermillion," &c., which are not entitled to the name. "Imitation vermillion" is an aniline colour thrown on a lead body, which would not appear always to be of a very durable description, the colour being liable to change. There are numberless names for it, such as "Columbian red," "zulia," "rubeido," "Roman red," "Swiss red," &c. These colours have largely superseded true vermillion, as they are of a brilliant red, and on the whole, withstand exposure fairly well, though as above mentioned there are noteworthy exceptions. On being affected, they change to a lighter colour instead of a darker, as is the case with genuine vermillion, and they are much lower in price.

Quicksilver vermillion is considered to be superior in body, permanency and richness. The scarlet chromates of lead whilst possessing enduring qualities, lack body, and are not so rich in colour. Of the pigments known as eosine it may be said that they are intermediate in character between the other two reds mentioned. Their colour is exceedingly brilliant, and the body good; but they are often very fugitive.

Red Lead.—This, known also as minium, is an artificially-produced oxide of lead, manufactured by lead refiners and corrodors. Litharge is of similar character.

Ochre.—Ochres are hydrated oxides of iron, containing varying proportions of ferric oxide and water. The term has also come to include earthy mixtures of silica and alumina, with oxide of iron, and sometimes calcareous matter and magnesia.

"Indian red" is a term originally given to a mineral from the Persian Gulf, and used as a pigment. Speaking generally, ochre is found wherever iron is mined. Ochres vary in colour from light yellow to a deep orange or brown, and consist of iron peroxide and water, with varying proportions of clay in a state of impalpable subdivision. Typically, it should contain about 80 per cent. peroxide of iron, and 20 per cent. water, but it is very rarely found quite pure, and is undoubtedly a decomposition product. That kind known as high grade ochre is principally used by paint grinders.

Umber.—This is a natural mixture of limonite (hydrated ferric oxide) and hydrated manganese, with clay. Certain mineral pigments are sometimes mixed together to form an artificial umber. It is a rich brown colour.

Sienna.—This is a name given to clay coloured by the peroxides of iron and manganese. It is largely prepared in Italy.

Ultramarine.—Strictly speaking, this term should be reserved for the blue pigment obtained from "lapis lazuli." As that mineral is of very rare occurrence in Nature it need hardly be remarked that what are commonly called ultramarines are only imitations of the real thing. The finest examples of "lapis lazuli" have been obtained from Persia, Lake Baikal, Bokhara, and more recently from China. Only two or three per cent. of the purest article can be obtained from the best stone, and the pigment, therefore, is very expensive, and only used by artists. For our own part, we are under the impression that real ultramarine is hardly ever now used.

The artificial preparation is composed approximately of 46.60 per cent. silica, 23.30 alumina, 3.83 sulphuric acid, 21.48 soda, 1.00 iron oxide, and traces of lime, sulphur, and magnesia. The ingredients employed are sometimes china-clay, sodium sulphate, charcoal or pit-coal, and resin; or china-clay, soda, silica, sulphur, and resin. The raw materials are ground very fine, well-mixed, and pressed, and contained in muffle furnaces, at a red-heat for twelve to thirty-six hours, or until the sulphur is nearly burnt off. When the firing is complete the furnaces are closed tightly, and the material is allowed to cool, requiring five to six days. The product is first green ultramarine, which, during the cooling process, changes into a dark blue. After washing, it is ground in wet mills, for from two to five days, settled under the action of heat, repeatedly washed, classified, dried, bolted, and packed.

Slate and Shale.—These are used to a limited extent in inferior paints, as pigments after grinding. They produce green, slate, red, and drab colours. The ground pigment is mixed in oil in proportions as desired. It is principally employed in the preparation of certain roofing paints.

OBITUARY.

MR. BENJAMIN BUCKNALL.—The *Times* says that by the death of Mr. Benjamin Bucknall, architect, which occurred at Algiers on November 16, the English colony there has lost one of its best-known and most valued members. The friend and companion of Viollet-le-Duc, several of whose works he translated into English, and whose guest he was while the great French architect was rebuilding the Château de Pierrefonds for Napoleon III., Mr. Bucknall went to Algiers about twenty-two years ago. He had gone there in search of health and without any definite idea of remaining; but, charmed with the country and his surroundings, he settled there permanently. With singular knowledge and good taste he adapted Moorish art to modern requirements, and the many beautiful villas in the neighbourhood of Algiers which he built or reconstructed for French, as well as for English owners are very graphic evidences of his genius and good work. So successful was he that he was employed by wealthy natives as well as by Europeans. Mr. Bucknall died after a short illness following on influenza. His funeral was so largely attended by persons of all nationalities and classes that it assumed almost a public character.

GENERAL BUILDING NEWS.

THEATRE, HEATON, NORTHUMBERLAND.—The foundation stone of the new Grand Theatre at Heaton, was laid on the 17th inst. The building is situated at the extreme west end of Shields-road, and is designed to seat about 2,500 people. The sides abut into the public streets; three exits being provided for the pit, two for the gallery, and one large staircase for the circle. The length of the building from the curtain to the back of the pit is 67 ft., and the width of pit 58 ft. The stage, which is 58 ft. by 44 ft. 6 in. has been designed to accommodate the largest productions, and has a large suite of dressing-rooms on each side. A separate staircase leads from each suite direct to the street.

The stage will be cut off from the auditorium by a fire-proof curtain. The principal entrance to the building, which is at the south-east corner, is surrounded by a turret. This entrance leads into a vestibule, from which the circle and private boxes are approached. The building will be lighted by electricity, and warmed by hot water. The designs have been prepared by Mr. Wm. Hope, architect, Newcastle, and are being carried out by Mr. S. F. Davidson, builder, Heaton.

SUNDAY SCHOOL BUILDINGS, GOLCAR, YORKSHIRE.—The Baptists of Golcar have decided to build a new Sunday School on the central hall plan, to provide accommodation for 600 scholars. Mr. J. Berry, of Huddersfield, is the architect.

PRUDENTIAL INSURANCE COMPANY'S BUILDINGS.—The fireproof construction of the new buildings for this Company in Edinburgh and Dundee, of which Messrs. A. Waterhouse & Son are the architects, is to be carried out, including the whole of the constructional steel and iron work, by Messrs. Arrol's Bridge and Roof Company, Glasgow.

TOWER OF LLANGYNLLO CHURCH, RADNORSHIRE.—Plans for the restoration of the tower of this church have been prepared by Mr. F. R. Kempson, Hereford. The tower, it is reported, is in so dilapidated a condition that it is doubtful if it will stand the frost of another winter. It has been deemed advisable to cease ringing the bells placed within the tower.

BAKERY, LANCASTER.—A new bakery has just been erected by the Lancaster and Skerton Co-operative Society at Skerton (now incorporated with Lancaster). The buildings are of brick from the local Cloughton Company, and have been built by Mr. Rd. Cornthwaite, bricklayer, and oven-builder; Mr. Wm. Richardson, joiner; Mr. Liver, slater; Messrs. Calvert & Head, plumbers; and Messrs. Meadowcroft & Sons, painters—all of Lancaster. The building is of two stories, with the cooling-room and covered lorry entrance at the east end, the bakery in the centre, and the ovens and stoke-hole at the west end. The bakery and cooling-room are lined with white glazed bricks, and the ceilings finished in Robinson's cement and cream enamel painted. The upper story has a concrete and steel floor, and is used principally as a store room, the portion over the cooling-room being occupied by one of Crossley's gas-engines, which drives Messrs. W. H. Mascot, Limited, mixing, &c., machines, and the hoist over the entrance. Two of Cornthwaite's double-decker ovens are in use, and space remains for a third. The architect was Mr. J. Parkinson, of Lancaster.

BOARD SCHOOL NORWICH.—The new Board School erected in Angled-road, Norwich, has just been opened. The buildings are constructed on the central-hall principle, containing a small hall for the infants and a larger one for the mixed section. The dimensions of the latter hall are 92 ft. by 43 ft. Around it are arranged a series of eleven classrooms and the private room of the head-teacher. Upstairs is a suite of rooms, in course of completion, comprising chemical and physical laboratories, lecture-room, weighing-rooms, and preparation-room and store-room for chemical appliances. Mr. C. J. Brown, of Norwich, was the architect, and Mr. Hawes was the contractor.

PRIMITIVE METHODIST CHAPEL, KIRKBURTON, YORKSHIRE.—Plans are now being prepared for a Primitive Methodist Chapel at Kirkburton. Mr. J. Berry, of Huddersfield, is the architect.

SOLDIERS' AND SAILORS' HOME, NORWICH.—A new Soldiers' and Sailors' Home has just been built at Norwich. The premises are situated at the corner of Queen-street and Tombland, and were formerly used as a cigar and tobacco manufactory. The principal entrance to the home is in Queen-street, and on the left is a bedroom for the use of soldiers and sailors on furlough. On the right is the billiard-room, and through this the coffee-room, with the bar fronting both Tombland and Queen-street. The matron's house adjoins and faces Tombland, from which it has its entrance. On the first floor is a reading-room, and the writing-room is over the bar. On the landing is an emergency exit, with private access to Tombland. On the top floor is a lecture-hall. Opposite the lecture-hall is a similar room for committee purposes. Mr. A. J. Lacey, of Norwich, was the hon. architect, and Messrs. G. E. Hawes & Son were the contractors.

SCHOOL, WHITECHAPEL.—On the 18th inst. Sir John Lubbock, M.P., opened the new building of the Whitechapel Commercial School. Built by Messrs. Hammond and Son from designs by Mr. F. Pouler Telfer, on freehold land belonging to the parochial charities, it has cost between 7,000l. and 8,000l.

CO-OPERATIVE STORE, SKELMANTHORPE, YORKSHIRE.—We are informed that a new Co-operative Store is about to be built at Skelmantorpe, at a cost of 1,000l. Mr. J. Berry, of Huddersfield, is the architect.

COURT HOUSE, RICHMOND.—The foundation stone has just been laid of the new Borough Sessions House in Paradise-road, Richmond. The building was erected from plans prepared by Mr. Ancell. The new building contains in addition to the court-room, a magistrates'-room, clerks'-room, counsel-room, waiting-room for witnesses, and several apartments for those who are brought there by the police. Provision will also be made for the

meetings of the Main Sewerage Board, and the frontage of the building is put back six feet from the old line, so that some day the street may be widened.

FOREIGN AND COLONIAL.

FRANCE.—On Saturday the Municipal Council of Paris received, at the Hôtel de Ville, the members of the London Chamber of Commerce, who had come over to study the subject of the metric system of measurement with a view to its introduction into England. —M. Froment-Meurice, the sculptor, is at work on the statue of Chopin to be erected in the Parc Monceau. —A committee has been formed to raise a monument to the memory of Alexandre Dumas, in the Place Malesherbes, which it is proposed should take the name of Place Dumas. —The Council of Paris is about to demolish the Hôpital Trousseau, which has been found defective, and replace it by three smaller hospitals for children in the XIIIth, XVIIIth, and XIXth Arrondissements. It is announced that the fine Cité de la Vierge, built by the Connétable des Lesdiguières, and where Louis XIII. lived with his Court, is to be demolished shortly to give place to an industrial establishment. The chateau belongs at present to the Casimir-Perrier family. —In regard to the question of the preservation of the ancient "Cité des Baux" near Arles, it is now proposed to schedule the whole area called the "Vallon d'Enfer" under "Monuments Historiques." —M. Maurice Faure, Deputy in charge of the Budget for the Fine-Arts Department, has earnestly pressed the idea of the foundation of a School of Art at Arles. —M. Fernoux has been re-elected President of the Société des Architectes de France; M. Boubon has been appointed Vice-President, and M. Christie general secretary. —At its last sitting, the Parliamentary Committee occupied with the 1900 Exhibition discussed the question whether it was necessary to pronounce at once, as several members wished, on the general principle of the Exhibition. The result was that the Committee has postponed the final decision till it has had time to examine the communications with foreign powers, in order to come to an understanding as to whether the invitations to such powers are to be regarded as officially sent, and if France as a nation has entered into any engagement with foreign countries in connexion with the subject. The Committee also wish to know whether the financial co-operation of the Municipal Council of Paris is conditional on the acceptance of the plan as proposed.

GERMANY.—The "Old Post Office" at Berlin is in course of demolition, for the widening of the Königsstrasse. The Spittelmarkt is to be built over, a company having been formed to erect some public buildings on the ground. —The monument for the late Bruchsal Pascha is now ready. It consists of a fine granite slab (which has been brought from Sakara), on which a bronze semi-relief portrait of the deceased has been fixed. —An exhibition of photographs is being arranged for next year at Berlin. The Emperor will be the patron of the exhibition, and the local papers rightly. —The new block, which is to be the home of an annual fair or "Messe" at Berlin is now nearly completed, and will probably be opened in spring. The building is situated off the Ritterstrasse, and here Zedler, of Charlottenburg, is the architect. The plan practically includes a number of galleries and show-rooms, with a public assembly-room, a large restaurant, and elaborate offices. —Munich is to have some elaborate improvements, including the remodelling of the quarter between the Court Gardens and the Church of St. Anna, according to the plans of Herr Otto Lasne, who was a successful candidate in the great Vienna Improvements Competition, and we understand that the Municipality of Munich has now definitely passed this scheme. The proposed works will lead to the clearing of a very insanitary area. —There has been an extensive flooding of basements and cellars at Berlin, owing to the bursting of one of the upper mains from the waterworks, and several houses have had to be cleared, owing to the danger arising from injury to the foundations. The Berlin Fire Brigade has been requested to pump out the cellars, and has put a number of their steamers at the disposal of the house owners. —The Berlin Fire Brigade is to have several new stations, and among them a new central headquarters. The Municipality proposes purchasing a site of about 26,000 square metres, superficial, for the latter purpose, in the very heart of the city. The present headquarters of the brigade are to be materially altered, and a vote of 12,500 has just been passed for this purpose by the City Council. —The old military forage stores at Berlin have been bought up by a company, who propose adopting them for the purpose of a theatre, or rather for spectacular performances, similar to those of our Olympia, or the Empire of India Exhibition. Mr. B. Kiralfy, of London, is one of the managing directors.

AUSTRIA.—The statue of Raimund which is to be erected in front of the theatre of the same name is now nearing its completion. Herr Franz Vogel is the sculptor. A bust to the late *savant*, Dr. Stefan, has been unveiled at the University, where the central hall has been specially adapted for memorials of this

kind. —A monument in the memory of Schöffel has been erected on the Staffelfberg. —There was a destructive fire on the 17th inst. at the large gas-works in connexion with the Great Western Railway Station. A monument to Litrow has been unveiled at Abbadia; it is in the form of a life-size semi-relief, and the sculptor is Professor Rudolf Wier. —Further sections of the improvement scheme for Vienna have been passed by the Municipality. The sections which have lately been before them refer to the "inner circle" of the city, and the plans were prepared by the Municipal Board of Works. —The Vienna "Camera Club" has been invited by the Special Royal Archaeological Commission to assist in forming a collection of photographs from historical buildings in the city. Herr von Scholler is the President of the club, and assistance is promised on an extensive scale. —The new hospital was opened on the 19th inst. at Neunkirchen, near Vienna. There are sixty-two beds distributed among a central block, and four minor beds. The architect is Mr. Sehnal. —The Hungarian Parliament has as usual shown itself essentially patriotic in voting sums for the improvement of the waterways of the country. Fifty-four million florins are to be spent on such improvements in the course of the next five years. The Danube will require 24,000,000 florins, the Theis and Bodrog 12,000,000 florins. The money was voted unanimously. —It is of special interest to hear from Budapest that an international conference of railway managers has decided to materially lower the passenger rates to Budapest next year, on account of the Millennium Exhibition, which will be opened in the summer. The Austrian, Hungarian, Prussian, South German, French, Belgian, Italian and Oriental railways will be represented, but apparently, no English ones. This is much to be regretted.

RUSSIA.—The Technical College at Riga is increasing in popularity. The number of pupils this summer was 1,681, as compared with 645 of last year; but there were only twenty-six architects. The annual budget of the institution is under 20,000, and the library has nearly 13,000 books. —The new museum at St. Petersburg, which will have its home in the Michael Palace, will be called "The Russian Museum of Alexander III." The galleries of the Palace are very extensive, and the old music-room and the private theatre are to be altered to suit the new requirements. The collection will be limited to the Russian arts and crafts, and the first galleries which will be opened are the picture and sculpture halls.

MISCELLANEOUS.

LECTURES ON ALTERNATE CURRENT TRANSFORMERS.—A course of four Cantor lectures will be commenced on the 20th prox., at the Society of Arts, by Dr. J. A. Fleming, F.R.S., on "Alternate Current Transformers." The lecturer will deal with the action, construction, testing, and employment of the transformer.

PLUMBER'S WORK.—In view of the great importance in a sanitary respect of the work of plumbing we have been for a considerable time engaged in an inquiry as to the relative efficiency and cost of plumber's work. We have been much struck by the absence of any definite information as to the latter point, and have as far as possible endeavoured to supply the deficiency. Our inquiry is now practically completed, and we propose to publish in the course of a few weeks the results of our commission's investigations. These investigations have been undertaken independently by us, and we are solely responsible for the result. We have thought, however, that their value would be enhanced if the report were submitted to the criticism of experts. The Worshipful Company of Plumbers very courteously and readily fell in with our request, and appointed a committee to consider our report and make suggestions or criticisms thereon. The committee have devoted much time to this work, and we shall have great pleasure in printing their report as an addendum to our own. Their criticisms, whether destructive or the reverse, will be equally welcome. —*The Lancet.*

THE LAST SALES OF THE LONDON MART.—The last sales of the year at the London Auction Mart, Tokenhouse-yard, have just been held, when properties of various descriptions to an amount of nearly 10,000l. changed hands. The total sales reported for the present year amount to 5,597,775l., as compared with 4,090,195l., 4,230,332l., 4,597,652l., 4,774,016l., and 4,867,111l. respectively for the five preceding years. —*Proper Market Review.*

PULPIT, ST. CLEER CHURCH, CORNWALL.—This ancient edifice has just acquired a carved new pulpit. It has been placed on the south side, and is approached from the chancel by a flight of four steps. The base is six-sided, moulded. The angle buttresses are carved right up into the top cornice, which is carved all around with foliage of a conventional type. The panels are deeply recessed, and have ogive heads, ornamented. The panels themselves are filled by typical foliage. A movable book-board of polished brass is provided for the preacher's convenience. This work has been carried out by Messrs. Hare & Sons, of Exeter.

THE SANITARY INSTITUTE.—At an examination for Inspectors of Nuisances, held at Cambridge on the 14th inst., six candidates presented themselves,

to whom certificates were granted, as follows:—W. Carver, Wretton, Norfolk; A. Garland, Greenwich; E. Hayward, Dudley; T. H. Jones Bath; W. Kent, Watton, Norfolk; G. E. Yarnall, London, Norfolk.

CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.—The certificates gained by the students of the Crystal Palace School of Practical Engineering during the winter session were distributed on the 20th inst. at the School by Mr. W. R. Galbraith. The examiners, Messrs. C. F. Tufnell, W. B. Clark, and H. F. Parshall, having read their reports, which were very favourable to the School, Mr. Galbraith delivered an address to the students, in which he spoke of the enormous extension of the railway system of the United Kingdom since he entered the engineering profession many years ago. He added that, unfortunately, the supply of railway engineers had more than kept pace with the demand. Those who left the Crystal Palace School must not imagine that they were entitled to regard themselves as full-fledged engineers, but should recognise that they had still a large amount of practical knowledge to master. He had had the opportunity of going through the workshops and inspecting the School, and had been greatly pleased both with the drawings and the mechanical work of the students. He could not help feeling that it would have been of great advantage to him in his young days it had been possible for him to obtain such a training as was given in the School. It was obvious that the heads of the different departments had bestowed great care upon the instruction of the students, and Mr. Galbraith, having been distributed, Mr. G. T. Rait, on behalf of the Directors of the Crystal Palace Company, thanked the examiners for their services, and Messrs. Clark and Tufnell responded, the former remarking upon the great improvement which had taken place in the School since he was a pupil there in 1880. —The proceedings closed with a vote of thanks to Mr. Galbraith for presiding and distributing the certificates.

CHURCHYARDS AND SANITATION.—An Order in Council has been made for requiring the churchwardens, or others the custodians of the parish churchyard of St. Martin Orgar, to construct a dry area, 14 ft. deep and about 4 ft. wide, between the churchyard and the back walls of five houses, Nos. 5-9, in Crooked-lane, King William-street, and for the reinterment in the City of London Cemetery, at Little Ilford, of all the human remains disturbed during the progress of the work. The Order is made under the provisions of "An Act to amend the Burial Acts" of 22-7 Vict., and follows after certain representations to the churchwardens by the Home Office to the effect that the measures in question must be carried out in order to prevent the burial-ground from being dangerous to public health. The supervision of the works is committed by the Order to Dr. Sedgwick Saunders, Medical Officer for the City, and they must be executed to his satisfaction. Another Order in Council has been made under the Amending Burial Act of 16-7 Vict., for the discontinuance of interments in the parish churches of Great Clacton and Leyton, Essex; Downe, Kent; Horningsey and Great Wilburham, Cambridgeshire; Bayston Hill, Shrewsbury; Dwyddelan, Carmarvon; Beigham, Bergham, and Compton, Surrey; in chapels at Sherborne and Evesham, and in Handforth Church, Cheshire. The Order extends to the churchyards and chapel-yards severally belonging to these, with, however, certain enabling provisions in respect of vaults and walled graves in the burial-grounds.

"TULS TIDE."—The periodical, the name gives us its Christmas number a large chromolithograph reproduction of Mr. Yeames's clever and spirited picture "Prisoners of War," representing two English midgies, one of them a mere child, mounted guard over one of Napoleon's soldiers, amid the evidently sympathetic interest of the fishing population. The original painting was, if we remember right, in the Royal Academy some years ago.

NEWCASTLE SOCIETY OF ANTIQUARIES.—A meeting of this Society was held in the Castle, Newcastle, on the 13th inst. Mr. John Philipson, Esq., presided. Mr. Maberley Phillips read two letters of the seventeenth century relating to the castle. Mr. H. A. Adamson read a continuation of his paper on "Tynemouth Castle after the Dissolution of the Monastery." A description was given by the writer of the Castle, the prior's house, the extensive stables, and other buildings that at one time existed in the Castle grounds. Mr. Adamson produced several plans and pictures of the building as it had been, and said that Tynemouth Castle had suffered like many other buildings that had got into the hands of the Government, the most interesting features generally being destroyed and the most ugly buildings taking their place. The whole of the Spanish battery had disappeared, and it was now intended to pull down the Governor's house and make a playground for the soldiers, 4,000l. having been granted for the purpose. A vote of thanks was passed to Mr. Adamson. Mr. S. S. Carr read "Notes on the Recent Discovery of a Saxon Stone at Tynemouth," and received a vote of thanks for his contribution.

THE BUILDING AND REPAIRING OF CHURCHES.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENT.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiura.	Designs to be delivered.
Club Premises, near Wigan	Hindley Conservative Club Buildings Co.,	10l. 5s.	Jan. 24
Public Hall, Ezzell, N.B.	Legue Memorial .....	.....	Feb. 15

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Club Premises, Burnley Wood, Lancs.	Liberal Club	S. Reighley	Jan. 1
Waterworks, &c.	Ashbury Ireland	Official	do.
Un on	Letworth Union	do.	do.
Widening Burnley-cum	King's Norton & D.C.	R. G. J. Grey	Jan. 4
*Laying Drains, &c.	Sheffield United Gas Light Co.	Fletcher W. Stevenson	do.
Laying Gas Main	do.	do.	do.
*Iron Standards, Fencing, &c.	Borough of Colchester	H. Goodyear	Jan. 6
Laying Pipe Trunk (two miles), Rye, &c.	Isaacs & Co.	do.	do.
Bridges	Hanley (Staffs) Corp.	J. Lobley	do.
*Alterations to Middle-street School	Brighton and Preston Sch. Bd.	P. Simpson & Son	do.
School Alterations, Ferndale	Yateleyfold S. h. Bd.	J. Rees	Jan. 7

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Sewers, &c. Crofton	Bromley (Kent) R.D.C.	A. Williams & Son	Jan. 8
Drainage Works	Dublin Corp.	G. Chatterton	do.
Water-gas Installation	Manchester Corp.	Official	do.
*Road Materials	Cum. of H. M. W.	do.	do.
Filter Beds, &c.	Motherwell	do.	Jan. 9
Road Materials, Bognor	Comms.	Jas. McCallum	Jan. 10
*Works and Materials	West Sussex C.C.	G. Adcock	Jan. 10
*Houseware Pipe Sowers and Laying-out	Hanover Square Vestry	G. Livingstone	Jan. 11
Sewage Farm	Langport R.D.C.	J. T. Hawkins	Jan. 18
Additions to Asylum, Bodmin	County Asylum Visitors	W. J. Jenkins	Jan. 24
*Supply of Guernsey Granite, &c.	Stoke Newington Vest. Council	S. E. Burgess	Jan. 25
Drainage	Upball (N.B.) Parish Council	Official	No date
New Road	Berks County Council	do.	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Assistant Surveyor	County of Stafford	176l. per annum	Jan. 1

Those marked with an asterisk (*) are advertised in this Number. Contracts, pp. iv., vi., viii., & xviii. Public Appointments, p. xviii.

and Chapels held its usual monthly meeting at the society's house, 7, Dean's-yard, Westminster Abbey, on the 10th inst. Grants were made in aid of the following objects:—Building the new Church of St. Augustine, Preston, Brighton, 100l.; and towards enlarging or otherwise improving the accommodation in the churches at Kirkbride St. Bride, near Silloth, Cumberland, 25l.; and Thornton St. Peter, near Leicester, 20l. The following grants were also paid for works completed:—Ash-next-Sandwich St. Nicholas, Kent, 40l.; Willingham St. Mary and all Saints, Cambs, 70l.; South Bank St. John, near Middlesbrough, 200l.; Ripley St. John, near Derby, 90l.; and Rubery St. Chad, near Bromsgrove, 25l. In addition to this sum of 246l. was paid towards the repairs of thirteen churches. The society likewise accepted the trust of sums of money as repair funds for Christ Church, Helme, near Huddersfield, and St. Mary's, Horsey, Middlesex.

TECHNICAL EDUCATION FOR PLASTERERS.—A public meeting was held on the 10th inst. at the Club Union Buildings, Clerkenwell-road, for the purpose of taking into consideration the practical application of technical education to the plasterers' craft. Mr. D. Hennessey, Organising Secretary of the London District of Operative Plasterers, presided. Mr. Sidney Webb said that the Technical Education Board and the County Council took a very great interest in the classes, which had been started for the purpose of turning the mere "handyman" into the skilled mechanic. For plasterers three classes in fairly central situations had already been started, and competent men engaged to give instruction. He could not, however, say that these classes were quite so well attended as could have been wished. The plasterer was not so badly off as some of his fellow-workmen; his hours, especially in winter, were not so long, and he thought that it was quite possible for those who took any interest in the matter to give up their own amusement one evening in the week. He wished all mechanics to avail themselves of their opportunities in the way of becoming more skilled in their work, and not to be content to keep in the lower ranks, which were always overcrowded, and where the workman was in constant danger of being thrown out of work. Mr. W. R. Lethaby (Art Inspector to the Technical Education Board), Professor Banister Fletcher, Mr. E. Quirk (Instructor at the Battersea Polytechnic), and others also spoke.

NEW INSURANCE BUILDINGS, HANOVER.—The German Military Insurance Association, which has its headquarters at Hanover, has lately erected some very handsome offices in this town, Herr W. Hauers, of Hamburg, acting as architect. The office has given out over 250,000 policies, and required accommodation for a large staff of officials, with a provision for extensions. The principal block, which has lately been completed, cost over 31,000l. The plans are certainly very practical, and are well adapted for the proposed extensions, whilst the German Neo-Gothic style, which has been adopted, is far more successful than is usually the case in North Germany. Freestone has been used for the façades, and oak for most of the joinery. The interior decoration is very pleasing, especially in the board-room, where there are two well-executed frescoes by Professor Dopmeyer, representing "Peace" and "War."

FOOT BRIDGE, PARLIAMENT HILL FIELDS, HIGHGATE.—On the 21st inst. the foot-bridge erected by the County Council to connect Gospel Oak and that district with Parliament Hill Fields, Highgate, was opened by Mr. W. J. Wetenhall, L.C.C. The bridge is situated over the L. and N.W. Railway, midway between Gospel Oak and Hampstead Heath Stations. The Hampstead Junction Railway divides the district from the

recreation grounds, and for a mile no means were provided for the public to cross the line. The foot-bridge crosses the railway at a point where a former footpath passed through the fields. The bridge is of steel, with piers of blue Staffordshire brick, and is 20 ft. wide. It has cost 2,400l. The land for the approach on the Gospel Oak side near Roderick-road was purchased and the road made by the St. Pancras Vestry, at a cost of about 1,300l. The Brunswick Rock Asphalt Paving Co., of Gracechurch-street, have laid the whole of the asphalt paving. The contractor for the structure was Mr. George Palmer, of Neath, Glamorganshire.

PROPOSED EXHIBITION AT DRESDEN, 1897.—The Department of Science and Art has received, through the Foreign Office, a despatch from the German Ambassador at this court, calling attention to an International Art Exhibition proposed to be held at Dresden in May to October, 1897, to consist of collections of works from different countries, and to comprise works of painting, sculpture, and architecture, and of the delineating and multiplying arts, which have been produced during the last ten years.

GETTING RID OF PEAT-WATER IN LEAD PIPES.—In a paper recently read before the "Yorkshire Association of Students," at Leeds, Mr. Oscar Kirby, the Butley Waterworks engineer, dealt with the subject of the means of preventing lead contamination in house-water supply. It appears that in his district, where the water acts strongly on lead, the inhabitants had been told that it was wise to let the water run a little before using it for drinking and cooking, to get rid of the water which had been standing in the lead pipes, and this advice had been so thoroughly acted upon as to lead to a waste of 114 per cent. of water! Having come to the conclusion that it was the peat which supplied the elements that acted on lead, and that this was chiefly brought down in time of storm, Mr. Kirby has devised a flood-gate so poised that it admitted water under ordinary flow but closed the passage in time of flood, directing the water to another channel. To ensure the gate opening as soon as the storm-water had subsided, the storm-water weir is crenellated, and when the water subsides so as to pass through the "crenell" only, the gate, which had been kept closed by the pressure of the flood-water on its upper elbow, opened. Leaping weirs, tried for the same purpose of separating storm-water, had, he said, failed in their effect, and he proposed this form of hinged flood-gate as a more efficient method.

TRADEMARKS.—Messrs. W. P. Thompson & Co., of the British and Foreign Patent Office, Liverpool, write:—"An important decision has just been made by the Patent Office as regards signatures as trademarks. Section 64 Sub-section A of the Patent Act of 1888, states 'that a trademark can consist of a name of an individual or firm, printed, impressed, or woven in some particular distinctive manner.' The Patent Office, with the approval of the Attorney-General, has now decided that such a signature as 'The London Stout Company,' or the 'Eagle Brand Company,' or, we presume, the 'Midland Railway Company,' even though it be the real trading name of the company, cannot be registered as a trademark, and that no signatures will be allowed unless they consist of a personal name or personal names, with or without, we presume, the addition of '& Co., & Son,' or the like. Furthermore, the office have already decided that no trademark having no other distinctive part than a personal name, and which is found in a Directory as a surname, can be registered, and Judge North has gone so far as to extend this decision to any personal name found in any novel or other book, and in particular has refused to recognise as a trademark the name 'Tribby,' on the ground that it is a personal name in a novel, though there is no proof that it has ever been an actual surname."

GLASGOW BUILDING TRADES EXCHANGE.—The second of the series of monthly meetings of the Exchange on the 10th inst. when Mr. Robert Scott, measurer, Glasgow, read a paper entitled "Some Conditions of Contracts." Mr. Scott said that the conditions he proposed to deal with were those relating to the extent and character of the work in the contract, the variations, the extras, and the appointment of arbiter. The extent and character of the work was usually determined by the plans and estimate, and it was necessary that plans should be carefully prepared, so as to give a true indication of the nature and extent of the work to be contracted for. The detail drawings furnished during the progress of the work should only be developments of the original plans. The estimate should contain an accurate representation of the nature, quality, and measurement of the material and labour, each part being measured on a well-defined principle. In some cases such complete plans were not forthcoming, consequently, proper estimates were not supplied, and when the work came to be executed, details were found to have little or no relation to the original drawings, and disputes arose as to the prices for altered work. Mr. Scott proceeded to deal with the clause empowering architects to make alterations. He quoted the usual clause, commented on its elasticity, and advocated that the powers it contained should be as little taken advantage of as possible, so that contractors might only be called upon to execute the work truly contracted for. In dealing with extras Mr. Scott pointed out that many items arose where contract rates did not apply, and that those should be priced at fair and reasonable rates. With regard to the question of appointing an arbiter, he said that in ordinary contracts it seemed to be the custom for the architect to appoint himself to the post. He pointed out that as the architect was really agent for the proprietor this was naturally objected to by the contractor. He stated that the general opinion was that in all cases the arbiter should be some proper qualified person mutually chosen; and in the event of parties failing to agree on an arbiter, the arbiter should be appointed by the Sheriff of the county. Mr. Gray proposed a vote of thanks to Mr. Scott, which was cordially agreed to.

MEETINGS.

WEDNESDAY, JANUARY 1.

Builders' Foremen and Clerks of Works Institution.—Ordinary Meeting of the Members. 8 p.m.

SATURDAY, JANUARY 4.

Sanitary Inspectors' Association.—The President, Sir B. W. Richardson, will deliver his New Year's address.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

21,780.—**DRAIN TEST:** A. Harkest.—Consists of a hollow cylinder or movable float encircling a vertical tube enclosed within an outer casing containing water. The pressure is produced by means of the cylinder being immersed in water to a depth regulated to suit the test required.

23,213.—**VENTILATORS:** F. Smith and others.—Glazed earthenware ventilators for stables, &c., made with openings or funnels in the sides arranged to cause an up-draught in connexion with a louvre cap.

722.—**DRAINAGE:** K. Matthews and others.—A system of drainage in which the surplus water or sewage is first collected in settling pits, the clear effluent being then delivered to a well or boring, and discharged at an underground spring level. Means are provided for filtering the effluent from the settling pit before it is delivered to the well or boring.

LONDON.—For providing and fixing a complete system of pressure hot-water apparatus (with Tenthon boiler for warming the whole of Mawbey-road School, Old Kent-road, as enlarged, for the School Board for London. Mr. T. J. Bailey, Architect—
Maguire & Son, £115 15
J. Wenter Smith, Gray, 504 0
Hendry & Pattison, 457 0
* Recommended for acceptance by the Works Committee.

LONDON.—For providing a small boiler and hot-water coils in order to improve the heating in all the classrooms of the Cranbrook-road School, Bethnal Green, for the School Board for London—
C. Davis, £480
J. Wenter Smith, Gray, 504 0
Hendry & Pattison, 457 0
* Recommended for acceptance by the Works Committee.

LONDON.—For providing two sliding glazed partitions in the infants' department of the Beethoven-street School, Queen's Park, for the School Board for London. Mr. T. J. Bailey, Architect—
C. H. Sealy, £300
T. Christie, 9 17
C. Lyford, 183 0
W. R. & A. Hyde, 183 0
H. C. Clifton, 168 0
* Recommended for acceptance by the Works Committee.

LONDON.—For providing and fixing two sliding glazed partitions in the boys' and girls' departments of the William-street School, Hammermith-road; and also for fitting up the chemical laboratory, for the School Board for London. Mr. T. J. Bailey, Architect—
T. Christie, £300
J. W. Hammond, 958 0
G. H. Sealy, 255 0
* Recommended for acceptance by the Works Committee.

LONDON.—For providing a Kindergarten gallery and stepped flooring in the infants' department of the Hanover-street School, Islington; and for providing a new cloak-room, for the School Board for London. Mr. T. J. Bailey, Architect—
Dove Bros., £250
T. Christie, 177 0
W. T. Ballard, 174 0
McCormick & Sons, 186 0
* Recommended for acceptance by the Works Committee.

LONDON.—For enlarging the Dulwich Hamlet School, Turners-road, Dulwich, by a net addition of 450 places, and for other work at the school, for the School Board for London. Mr. T. J. Bailey, Architect—
W. King & Son, £6,871
W. Patterson & Sons, 5,694
Atherton & Dolman, 5,465
L. E. Nightingale, 5,465
C. E. Wallis & Sons, 4,700
* Recommended for acceptance by the Works Committee.

LONDON.—For enlarging the Cottenham-road School, Holloway, by 320 places, and for other work, for the School Board for London. Mr. T. J. Bailey, Architect—
G. S. S. Williams & Son, £18,235
W. Patterson & Sons, 18,200
Kilby & Gayford, 18,247
W. M. Dabbs, 17,134
R. A. Yerbury & Son, 17,131
Atherton & Dolman, 17,070
* Recommended for acceptance by the Works Committee.

LONDON.—For the erection of a school on the site in Kennington-road, to provide accommodation for 804 children, for the School Board for London. Mr. T. J. Bailey, Architect—
R. A. Yerbury & Son, £21,790
T. Langley & Co., 19,664
Lathby Bros., 19,297
W. King & Son, 19,484
Kilby & Gayford, 19,287
Atherton & Dolman, 19,287
D. E. Nightingale, 19,287
* Recommended for acceptance by the Works Committee.

MIDDLETON (Lancs.).—For sewerage, lavage, &c., Adelaide and Half-streets, for the Corporation. Mr. W. Weldon Borough Surveyor—
Fred Kershaw, Adelaide-street, Half-street,
John C. Shaw, 115 2 4 25 0 0
F. Freeman & Sons, 97 6 3 20 0 0
Thos. Kilburn, 98 6 8 20 0 0
F. Partington & Son, 94 15 5 20 0 0
Borough Surveyor's estimate, 111 10 8 39 13 6

PENKHLILL.—For the erection of new schools at Penkhill, for Messrs. R. Scriveners & Sons, Hanley—
Jones, £5,248
Bail & Robinson, 6,185
L. Price, 6,750
N. Bennett, 6,750
H. K. Embrey, 5,935
* Accepted.

ROMSEY (Hants.).—For the erection of school buildings, Ampfield, for the managers of Ampfield School. Messrs. Colson & Son, architects, Lewy-street, Winchester—
H. Severs & Co., £1,752 0 0
A. Targett, 1,487 12 6
Musshwhite & Son, 1,255 0 0
Jenkins & Son, 1,280 0 0
Charles Grace, 1,252 0 0
W. Green, 1,252 0 0
H. J. Kite, 1,252 0 0
G. Coater, 1,252 0 0
* Accepted.

SHOTTELMILL (Surrey).—For additions and alterations to school buildings, for the Managers of the National Schools. Mr. A. W. C. Harding, architect—
Doling, £779 0
Harding Bros., Shottermill (accepted), 62 15

SOUTHEND-ON-SEA.—For laying a sewer (465 ft.) Leigh-road, for the Corporation. Mr. Harold Harlock, Borough Surveyor, (accepted)—
B. Hes, £495 0 0
W. Swaker, 440 0 0
Win. Wadley, 400 0 0
W. H. Sprague, 352 15 3
* Accepted.

WINDSOR.—For alterations and additions at the Windsor Union Workhouse, for the Guardians of the Poor of the Windsor Union. Messrs. Edgerton & Summerbell, architects, of Windsor. (quantities supplied)—
Akers, £2,750
Rowland, 2,475
Gibson, 2,377
Reich, 2,377
Priher, 2,377
Rampside, 2,377
Kavall, 2,377

WREXHAM.—For additions, &c., to work-house, for the Union Guardians. Messrs. J. Morrison & Son, architects, 12, King-street, Wrexham—
Wrexham, £215 0 0
Bates, 215 0 0
* Accepted.

WREXHAM.—For addition and repairs to Grove Park School, Wrexham. Messrs. J. Morrison & Son, architects—
Turner Bros., £844 0 0
Davies Bros. Wrexham (accepted), 441 0 0
Henry Samuel, 318 0 0
Badwick, 325 10 0

TO CORRESPONDENTS.

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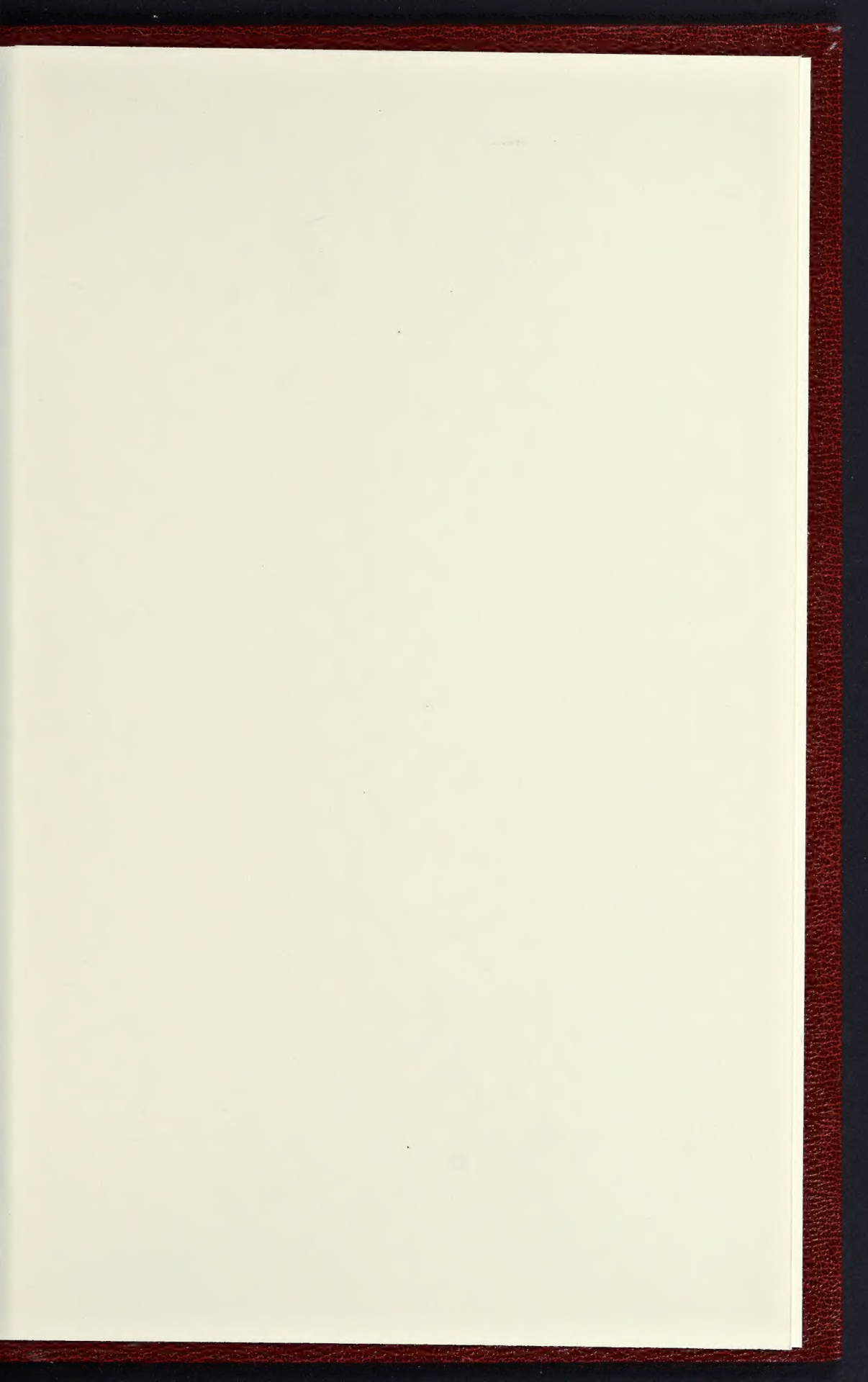
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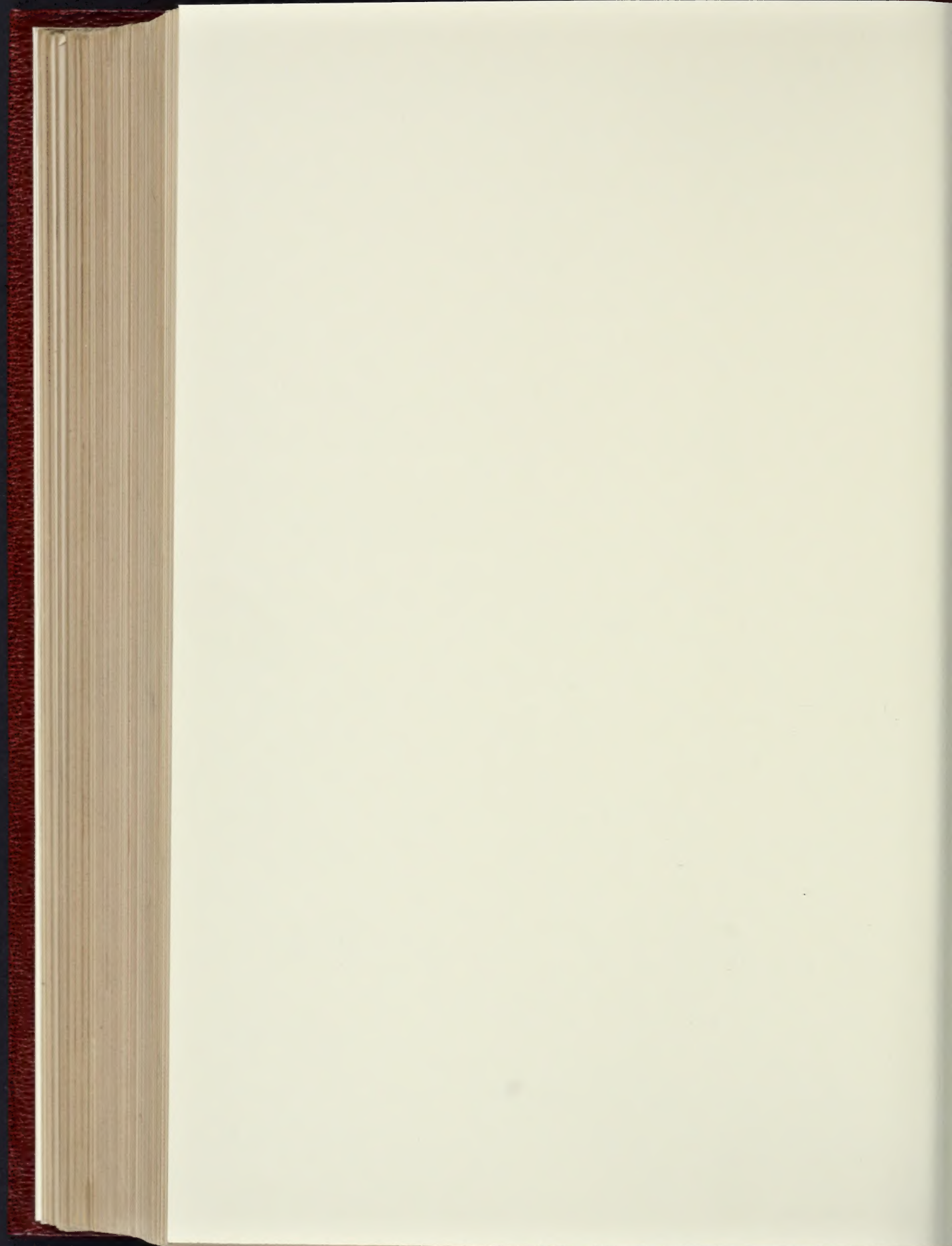
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